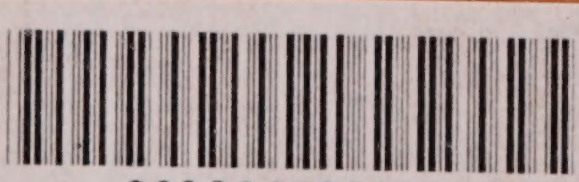
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Vol. 19

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THE

VETERINARY JOURNAL

AND

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JULY, 1884.

ACTINOMYCES IN SWINE-FLESH.*

BY H. C. J. DUNCKER, BERLIN.

My interest was greatly aroused when I learned to recognise dead trichinæ in pork, as first described by Leuckart; and it was not diminished when I found that the percentage of trichinous swine seemed ever to increase; in which, in addition to normal trichinæ, there were unhealthy-looking or dead ones. Continued observation led to the opinion that the death of the parasites did not result from any disturbance in the general nutrition of the body, but that we had to do with a peculiar disease of the trichinæ, perhaps dependent upon an unknown parasite. I had often observed that the dead trichinæ within the capsules gradually became broken up into small pieces, and that the process of calcification extended to the capsule, which became thick and opaque. Such bodies are with difficulty distinguished from the ordinary calcareous concretions met with in pork; indeed, the existence of remnants of the parasite, or the presence of other less altered worms in the flesh, will alone, in some instances, enable a determination of their nature to be made. In my present position as manager of the control-station of the Bureau of Inspection of the City Abattoir, I have had unusual opportunities for pursuing an inquiry into the subject, and have made some interesting obser-

* So much interest has been aroused in this subject by the communication of Herr Duncker, and by the article of Virchow in a recent number of his *Archiv*, that I requested Herr Duncker to let me present his views to English readers, and he kindly re-wrote the article, of which this is a translation.—W. Osler, M.D., *Montreal Veterinary College.*

vations, which have been published in the *Zeitschrift f. Mikroscopie und Fleischau.** And, first, a few words upon the forms of concretions in swine-flesh. Any one who has studied these bodies must have remarked that they are not always of the same appearance. They can usually be recognized with the naked eye, as single opaque white spots, or in rows along the course of fibres, in the interspaces of which they appear to be imbedded (Fig. 1). In

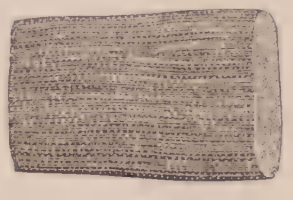


Fig. 1.

other instances, they are larger and more scattered. Both forms, in their finer details, are of very similar structure, but our interest here lies chiefly with the first. To get them isolated requires careful work, as they break very easily. When successfully teased out, they appear as round, oval, or bean-shaped bodies, thin in the middle, and with prominent borders, which in many instances are striated, or present a ray-like arrangement. The diameter ranges from 0·10 to 0·20 of a millimetre. In spite of all possible care, I was not able for a long time to determine the nature of these bodies ; but at last I came to the conclusion that they were calcified actinomyces tufts. On the 11th of January of this year, one of the Inspectors called my attention to the flesh of a measly pig, which contained, in addition, a remarkable number of dark-looking muscle fibres. As I had never seen this form of muscle degeneration so marked, I procured more of the flesh, in order to prepare specimens for the histological collection of the abattoir. The preparations showed between the normal muscle fibres others very irregular in form—broken, granular, and of a dirty-brown colour ; and within the sheaths of these, at variable distances, there were well-defined dark bodies of the shape of coffee-beans. With a power of 150 diameters, they appeared radially striated. With 650 diameters, the affected

* Verlag E. Hopf, in Spandau, Berlin, No. 3, 1884, in which the first communication upon actinomyces in pork appeared.

fibres were found to contain muscle *débris*, oil droplets, and a great number of fine micrococcus-like granules, in tremulous motion; and it then occurred to me that the dark bodies within the sarcolemma had a certain similarity to tufts of the actinomyces. Naked-eye examination of the flesh revealed the course of the degenerated fibres by their colour, and also the bead-like arrangement of the calcareous bodies in them, as shown at Fig. 1. Further microscopic study of the affected fibres showed that, here and there, portions of the muscle substance could be distinguished, but the aggregations of micrococcus-like granules (often to the extent of distending the sarcolemma) and the dark bodies above described, were the most characteristic features. The latter were determined to consist of highly refractile, well defined, club-shaped mycelia, centrifugally arranged, more closely compressed, and not so distinct as the tufts of actinomyces in the tumours of the jaw in cattle. With cochineal they became still better marked. The proper solution is made by adding to water, acidulated with acetic acid, enough of an alcoholic solution of cochineal to give a pale-red colour. In this, small bits of the muscle colour well in eight or ten hours, while the actinomyces become more deeply stained. Although the freshly-prepared specimens show very clearly, they do not keep well, as the contours of the mycelia become indistinct. On showing the preparations to Dr. Oscar Israel, one of Professor Virchow's assistants, who had been studying the development of this fungus, he remarked on the same difficulty which he had in his culture experiments. The tufts appear to have a very slight power of resisting reagents, and, according to Dr. Israel, the rapid changes seem to be due to a process of imbibition. This case, although it left many points unexplained, proved that swine flesh was sometimes infested with actinomyces, and that the calcified tufts were not to be distinguished, macroscopically, from the ordinary calcareous concretions, a microscopic examination being necessary to determine between them. From previous observations I knew that this condition was by no means uncommon, and I demonstrated the specimens to the staff of inspectors at the abattoir, in order that they might be readily able to select suspected portions. The result was most satisfactory; for in more than

twenty cases the fungus has been discovered. The power used by the ordinary inspectors in examining the muscle for trichinæ is only fifty diameters, and does not suffice to do more than determine the presence of numerous degenerated fibres, or the calcified bodies within the sarcolemma. In these animals I have been fortunate enough to trace the development of the fungus, and the pathological changes which accompany its growth.

I had not intended making a preliminary communication ; but as Professor Johne, of Dresden (who had seen one of my preparations, taken from a not very typical case, and which had probably undergone the changes above-mentioned), has on several occasions stated that the fungus described by me is not actinomyces, I shall here briefly refer to my additional observations. The fungus is most commonly found in the abdominal muscles, the hams, the intercostals, and the diaphragm. In the ham muscles as many as twenty per cent. of the fibres are sometimes affected, and the meat appears turbid and watery. The first appearance of the fungus can be recognised by the peculiarly irregular contour of the affected fibres, and with high powers one sees at this time the appearance of an intense interstitial inflammation of the muscle, and within the sarcolemma, between the individual fibrils, innumerable micrococci. Gradually, with an increase in inflammation, the substance becomes more and more affected, not in the entire length of the fibre, but here and there bulging occurs from the accumulation of micrococci and of the mycelia, which soon make their appearance. The branches of the mycelia appear to grow from the closely-set coccus-like aggregations, and they have the characteristic club-shaped extremities. Sometimes only the bulbous ends of the tuft can be seen, or one, perhaps, projects beyond the others. In some of them I have been able to see at the ends divisions, as if gonidia were in process of formation. The later stage of the process is the shrinkage of the mycelia, and its impregnation with lime salts. As in *A. hominus* and *bovis*, the *Actinomyces suis* does not always display the club-shaped mycelia, particularly if the affection is in an early stage. The calcification appears to supervene pretty rapidly, and compresses the tufts. When this has taken place, the application of acids does not render the fungus apparent.

The encapsulation of the hard concretions takes place in the same way as the trichinæ. In conjunction with Dr. Hertwig, veterinary superintendent, animals have been inoculated, and cultivation experiments instituted, which are expected to yield interesting results.

In conclusion, two questions arise:—(1) How does the presence of the actinomyces affect the living swine? and (2) What significance has the fungus for the practical meat inspector? The first of these questions must be solved by the veterinary surgeons; the last—here in Berlin, at least—has received its solution, inasmuch as the carcases of swine which are much affected are consigned to the knacker.

SINGULAR CASE OF RABIES IN A DOG.

BY E. M. DAVY, M.R.C.V.S., ABBEY ROAD, LONDON.

On Monday morning, April 28th, I was requested to call in the neighbourhood to see a fox-terrier dog, about two years old, and bred by the owner, which, I was informed, had completely bitten his tail off during the previous night. On arriving at the house I ascertained that the dog was still shut up in his kennel in the garden. I went out to it, and, much to my surprise, I found that the information I had received was perfectly correct, and nothing of the tail (which was about six inches long) remained. The dog answered to his name on being called, and seemed to wish to be noticed. My client was desirous that I should have him in my infirmary, and as I anticipated I had a case of Rabies to deal with, I took every precaution in removing him. During that and following days he continually tried to vomit, but unsuccessfully; he drank water freely, and ate a little bread and gravy. The following day (Tuesday) there were no further symptoms; but on Wednesday, when his box was being cleaned, he viciously caught hold of the broom, but beyond that there was no change.

He continued to eat and drink, and his motions were natural. On Thursday afternoon a stick was used instead of the broom, and he again flew at that, yet still continued to eat and drink a

little ; but during the night he bit the woodwork of his box, and on Friday morning died, without having shown any further symptoms.

On making a *post-mortem* examination (at which Professor Axe, of the Royal Veterinary College, was present), I found every indication of Rabies.

I may add that this dog did not once give the well-known and distinctive howl of a rabid dog ; also, that I carefully examined his kennel, which had not been touched since his removal, and could find no trace of his tail, with the exception of a few blood-stains.

I send particulars of this case for notice, thinking it is a very singular one.

VETERINARY REPORT ON BENARES.

BY VETERINARY SURGEON R. W. BURKE, M.R.C.V.S., A.V.D., BENARES.

THE district of Benares constitutes part of the alluvial valley deposited by the river Ganges. Its surface, which is made up of a rich clay, more or less mixed with loam, blue tilt, and reddish sand, consists of a level plain, with a gentle upward slope on each side from the central depression, and watered by the Berna in the west, the Nand river in the north, the Gumti, which runs through the district for a course of some twenty-two miles (joining the Ganges at about sixteen miles below the city), and the Karamnasa in the south-east border—the latter often subject to sudden flushes, which produce considerable inundations, especially after the rains, but remaining almost dry during the hot months. The Berna would also run dry in the cold weather, and during the early summer months, were it not prevented by a dam thrown across it about a mile before its confluence with the Ganges. Three small *jhils*, or marshy lakes, are to be found in the northern land, the malaria from which, during the dry, hot months, is very productive of febrile diseases, and, in the human subject, Cholera. The bottom of the three smaller streams—excepting the Karamnasa in the south-east—is also naturally filthy, and particularly offensive when allowed to dry under the rays of a strong sun during the hot months, and must, therefore, tend to the propaga-

tion of disease from deleterious emanations. A few patches of barren land (saline efflorescence), called by the natives *usár*, occur here and there; otherwise the district is constituted by an almost wholly cultivated land, abundantly irrigated, and usually very fertile. This variety of soil (*usár*) is not so tenacious of moisture, and unless it receives abundance of irrigation, is not very productive. The inferiority of soil in some parts is attributable to the fact that, being of a more sandy composition, it retains moisture for a shorter time. The only stone found is *kunkur*.

2. Altogether Benares does not form the most favourable receptacle for the location of Government animals—the *genus homo* not excluded! The climate is hot and moist, and skin disorders of a somewhat obstinate and peculiar character, from hyperaction of that covering, are not uncommon, especially Prurigo, Erythema, "Bursatti," and specific Ptyriasis, which will be shortly described by me on another page. The temperature more nearly resembles that of Lower Bengal than that of the upper country beyond Allahabad or North-west Provinces. I paid a flying visit to Benares, on casting duty, in December last, and the temperature then, as well as I remember, was low —60°. In February, on completion of special duty at Allahabad as inspector of animals returning from Egypt, I assumed veterinary charge of the battery in Benares, and the thermometrical readings from that time to March ran from 62° to 79°, when there was a slight rise noticed towards the latter part of April, viz., to 87°, to 92° in May, June, and July, August 90°, September 86°, and October 80°.

The hot east winds blow during April and May, and sometimes till later, and were the cause, as I believe, of a few cases of "Granular Ophthalmia" in horses, that occurred during the early part of my veterinary charge of G/1 Royal Artillery in Benares.

These winds also retard the process of repair in wounds, by exciting pus formation.

The course and termination of previously weakened or diseased tissues, as the result of inflammation, as also febrile disorders, asthenic states of the system generally, etc., are moreover materially influenced by the prevalence of the latter; and it is even surmised that the production of *kumree* (Specific Paraplegia

of the horse) is sometimes referable to the same cause, although to my mind, this phase of the etiology of the disease would appear doubtful.

The action of blisters during these winds is considerably heightened ; one to sixteen parts of Cantharides being about equivalent to one to six employed in colder climates. Further, an aperient is about equal to a purgative at home. Sedatives require to be used with even greater caution, and in smaller doses.

3. No Government stud operations are carried on in or near Benares. The ordinary country-bred horse, of an inferior type, having a coarse body, weak hocks, round in the buttocks, bad shoulders, narrow-chested, and nearly always "running to leg," common to Lower Bengal, is also to be met with in this neighbourhood. The only place where horse-fairs are annually held is Bălyâh, situated some fourteen miles down the Ganges, beyond Ghazipur.

No parasitic diseases have come under my notice since I have held veterinary charge at Benares, excepting the *Tinea tonsurans*, of which we had a few cases.

4. The grasses to be obtained in this district are "dhoob" and the other shorter grasses abundant during the monsoons, lucerne and guinea-grass, specially cultivated under battery arrangements for the use of the horses. The principal grains are—Barley, wheat, rice, oats, peas, gram, mote, and linseed. Bajrâh, jōâr, Indian corn, and other common food grains are procurable in the autumn. Cotton-seeds are also largely used as food for cattle, and by virtue of the large proportion of oil they contain, prove very nutritious, especially in milch cows. Măsōōr, mōōng, ùrid, and other pulses are also used with a similar object, and when required to fatten animals for the market.

5. The water is obtained from a pukkah well, situated about fifty yards from the centre of the horse lines. Its chemical properties : "Chlorine, free ammonia, nitrous acid, sulphuric acid, nitric acid, zinc, magnesia, and silica—of each a trace. Albuminoids, a small quantity." Common earth is held in solution in variable quantity during the rains.

6. The stabling, constructed in the year 1860, and comprising two rows of buildings placed parallel to each other, affords accommodation for 136 horses ; each building is constituted by

two rows of pillars, the distance between the central pillars, transversely, is about six feet, and between the outer and central ones about ten feet. The two outer rows of pillars are built of pukkah masonry; the two central ones of kutcha-pukka masonry. Between the central pillars is a raised platform of rammed earth, a foot high. The flooring of both the stables and outstanding buildings consists of rammed earth with a pukkah drain running along the outer row of pillars. The cubic space allotted to each horse is 800 cubic feet. The ground under the horses forms a bad floor, being made of common earth, and is difficult to keep in proper repair; besides, urine is readily absorbed. I at the first recommended, through the officer commanding, *kunkur* flooring as a substitute; but the Public Works Department considered it much too expensive an undertaking, and therefore refused to adopt my recommendations, on the plea of expense alone. On a subsequent occasion, when I had to report an outbreak (sporadic) of some five cases of Loodianna Disease, or Anthrax Fever, in the battery, I again made strong representations to the officer commanding, with the view to having the floors replaced by *kunkur;* but his efforts proved of no avail, and the floors were renewed by ordinary earth. The roof of stables is low, offers imperfect protection, except from the actual rays of the sun, and there is no roof-ventilation present.

The sick-lines are most unsatisfactory, comprising only four stalls, and continuous with other stalls occupied by healthy horses. In short, there is no separation of the sick from the healthy!

7. The sanitary condition of Benares, in point of natural drainage, is generally good, as there is a fair fall to the rivers, and the surface-water quickly runs off. Water from the stables is carried off by a pukka drain. The manure is collected and allowed to decompose under the heat of the sun, and is then used as a top-dressing for a lucerne bed kept by the battery.

8.

	Gram.	*Bran.*	*Grass, mixed.*
Quantity.—	3-3¼ srs.	1-1¼ srs.	20 srs.
Quality.—	Good.	Moderate.	Fair.

The gram is occasionally a little under weight, otherwise good. Linseed was supplied to certain of the horses at my recommendation by the Commissariat Department. The proportions of gram and bran had to be varied according to the time of year. The gram was crushed, then mixed with bran, and water sprinkled on it, and the whole allowed to soak for the space of about twenty minutes before issue to the horses—ample time for it to "sweeten."

I.—Cases.

Cases of Deaths, showing the post-mortem appearances, taken from the Record of Treatment.

(*a*) Case 39, G 25. *Enteritis.*—Admitted on the 7th April, at 4 p.m.; died the following day, 10.15 a.m.

Post-mortem examination showed the following:—Softening of the mucosa of the intestines, especially of the cæcum and colon; serous exudation into the connective tissue and fibrous band of the colon; liver softened from extravasation; the lungs congested in patches; blood unusually liquid; dark blotches on the buccal membrane. I suspect Anthrax!

(*b*) Case 51, G 72. *Anthrax Fever.*—Admitted on the 4th of May. Died the same day, after an illness of five hours.

Post-mortem examination revealed serous effusions into the abdominal and thoracic cavities; effusions of yellow sero-lymphoid fluid into the connective tissues over various parts of the body, but particularly around the kidneys and about the pelvis generally; the kidneys disintegrated, from bloody extravasation, and the medullary and cortical portions rendered indistinct and presenting a uniform appearance throughout; lungs congested; ramiform injection of the vessels of the visceral peritoneum.

(*c*) Case 52, G 33. *Anthrax Fever.*—Admitted on the 4th of May, along with Case 51; died on the morning of the 7th *idem.*

Post-mortem examination revealed the following:—Presence of general gastro-enteric lesions; softening and disintegration of the intestinal secretory glands, especially of the Peyer's patches, from extravasation; effusion of serum into various parts of the

body, especially into the parenchyma of organs and into loose connective tissues generally; blood unusually thin, and presenting a tarry aspect, from disintegration of its corpuscles.

II.—Diseases.

(*a*) *Prurigo.*—There is a peculiar form of Prurigo in the horse common to the wet season in India, as I must observe, the etiology of which does not seem to be generally understood, but is easily explained, I think, by what is seen to follow the mode of treatment that was adopted by me in these cases. I have prescribed large and alternate doses of calomel, muriatic acid, and sal-ammoniac, with the best results, which leads me to conclude that this affection—in the horse, at least—is sometimes referable to retention of the biliary acids in the system, due to imperfect bilification. There was scarcely a horse in one sub-division of the battery under my veterinary charge at Benares that did not show signs, more or less, of having similarly suffered during the months of June, July, and August, and made it impossible for me to keep a record of them, which recovered under the above course of treatment, on detection of the results following the same in the first case. Symptoms: Itching was among the first symptoms noticeable, particularly in parts previously injured or diseased (instance, *brand-marks* about the neck, on the shoulders, barrel, gluteum, etc.); the vessels of the skin became congested; there was present some amount of heat, supersensitiveness, etc., followed by effusion into the corium, which was either removed by absorption if early treated, or terminated, as it sometimes went on to pus formation, in abscess, and finally burst, giving rise to troublesome ulcers. A frequent accompaniment of this disorder was pallidity of the mucous membranes, and even loss of appetite, impaired digestion, fœtor, and discoloration of the fæces, etc.—symptoms indicative of biliary derangement.

(b) Contagious Impetigo of the Horse.—I have had but a single opportunity up to the present of dealing with this disease in the equine species, but I am strengthened in my opinion by what has appeared in the descriptions of it by Dr. Tilbury Fox as affecting

man, who has had a very extensive experience, a proof of which is seen in his recent work on "Diseases of the Skin." So rare is this disease that probably few have hitherto seen a well-marked case, at least in the horse. Because a disease is uncommon, it is not, therefore, to be disregarded. There are few diseases, however infrequent, which will not be met with in the future. It is necessary, therefore, to be acquainted with the diseases which are rare, as well as familiar with those which are common.

To attempt to give a detailed account of it would not come within the scope of the present purpose. I shall therefore merely describe the first case, taken from the record of treatment :—

Impetigo Contagiosa Equi.—Reported by the sergeant-farrier as a new "Leg-Disease" among some fifteen horses (inclusive of officers' chargers) of the battery. On examination was found to correspond with the Contagious Impetigo of man described by Dr. Tilbury Fox. Numerous discrete vesicles developed themselves about all four limbs, from the knee and hock downwards, in some cases attended by slight œdema of the surrounding skin, which appeared otherwise healthy, except that it was bedewed with a honey-like discharge that obtained from the vesicles as they burst. This discharge appeared to be of a harmless character, as it did not excoriate the skin over which it passed on escape from the vesicles aforementioned. They were characteristic in appearance, being pearly white, and resembled so many little watery bladders situated under the hair, and seen when the latter was raised by the hand. *They showed no tendency to coalesce, but remained discrete throughout their pathological course.* The eschar which formed during the subsequent stages, on spontaneous rupture of the vesicles, was matted to the hair in a characteristic manner, and appeared to be glued on. In two cases the disease attacked the body in addition to the limbs. The malady, which has hitherto escaped notice in the horse, was seen to be confined to a sub-division of chestnuts only, excepting one horse, which was a roan with white legs; and the officers' chargers, one belonging to Lieut.-Col. Battiscombe, and another, a battery horse ridden by Lieut. Frost, were also both chestnuts! The spread of the disease was clearly by contagion, effected through adjacent

horses—the disease having appeared at one end of the sub-division, thence spreading to the other.

Inoculated Case 54, G 7, on the body with its own exudate, removed from the limbs, with effect, producing characteristic vesicles all round the inoculated area within a few days. The duration of the disease was short—a little over two weeks. Inoculated a dog, with negative results, proving that it is not indigenous in, at least, not communicable to, this animal. Inoculated the same dog thrice, in the interdigital space, on the inner surface of the ear, and lastly in the groin—with no results.

Treatment.—Isolation. Dressings of nitrate of silver and sulphate of copper, and cleanliness—after first clipping the hair of the affected parts by the horse-clipping machine. Physic-medicine was also prescribed in one or two cases, attended by slight pyrexia.

(*c*) *Ptyriasis, Tropical*, or the so-called *Eczema Papulosum* of some practitioners, *Chronic Psoriasis* of others.—Of this there was also a great number of cases among the horses during the past season, of which nineteen of the worst only have been recorded. A brief general description of one of the cases, taken at random from the record of treatment, will here suffice to explain its nature and pathological characteristics.

(*To be continued.*)

FOOT-ROT IN SHEEP.

BY W. PENHALE, M.R.C.V.S., BARNSTAPLE.

THE importance of Professor Axe's discovery as to the cause of "Seedy-Toe" in the horse recorded in *The Veterinarian* for January, is one which cannot, in my opinion, be over-estimated especially when viewed in the light of comparative pathology. It is well known to all of us that some of the lower animals suffer from several very troublesome diseases of the horny covering of the feet, notably that of "Foot-Rot" in sheep. For the origin of these affections we have hitherto been able to give no adequate reason, but that they exist is patent to any ordinary observer walking over the sheep pastures of this country; for

there he will find animals by the score suffering from painful lameness, due to a disease of the hoof. Any discovery tending to elucidate the causes and cure of Foot-Rot in sheep must result in immense gain, not only in lessening the pain to the animals themselves, but also in the food supply of this country, for it is a well-known fact, that it is not only impossible to get a flock either of lambs or adult sheep to fatten, but, on the contrary, they will lose the condition they have on them, and death is not unfrequent whilst suffering from this disease.

That Professor Axe's observations on Seedy-Toe in horses also apply to Foot-Rot in sheep, I believe there is abundant proof, and I hope that he will not rest satisfied until he has found the "Foot-Rot parasite" also. I am, in common fairness, bound to admit that my efforts to find this parasite have so far resulted in failure, but that it will yet be discovered I have not a shadow of a doubt. That this disease is of parasitic origin there is, to my mind, sufficient evidence. The very history of the disease itself points in this direction. It is contagious, all breeds become affected, no kinds of soil are exempt, and the successful treatment of cutting away all diseased portions of hoof, and applications of powerful escharotics which are germicides—all tend to show that the disease is parasitic. Undoubtedly the heavier breeds suffer more severely than the lighter; Dorset horns are very susceptible to it; in some localities it is found almost impossible to keep this breed in a thriving condition from the fact of their suffering so much from Foot-Rot. The Shropshire and heavy Downs are next in order, and suffer almost as badly, whilst mountain breeds become the least affected; but there is no breed of sheep which can resist the disease entirely if brought in contact with the contagion. That it is contagious we have ample proof; many farmers in our own country can trace its introduction to their flocks from the purchase of a ram or other sheep affected with Foot-Rot, and have found to their dismay and cost, that when once the soil of a farm becomes impregnated with the contagion it is almost impossible to eradicate it again. So well-known is this fact, that in some of our Colonies laws are passed prohibiting the passage of sheep from infected into sound districts. In South Australia, the River

Murray divides the State of Victoria from New South Wales; on the Victoria side of the river the disease is rife, whilst New South Wales is free. The Legislature of the latter State consequently prohibits the introduction of sheep from the former, and so it remains free; although the natural conditions of climate and soil of the two districts are very similar, the river only dividing them.

Professor Law also, from extensive observations on the prairies of America, where he had exceptional facilities for the study of this malady, which a country where sheep have been kept for centuries does not afford, is fully convinced, and is very emphatic, that Foot-Rot is a contagious disease.

It is easy to understand that some soils are more retentive of the germs or parasites than others. I am well acquainted with a piece of land which is so full of the infection that it is with difficulty the owner can induce his shepherd to pasture the sheep on the land, on account of the universal outbreak of Foot-Rot in the flock which invariably follows. Sheep which are kept on old pasture land laid on deep soils formed from alluvial deposits, undoubtedly suffer the most; all kinds of clay offer a good and retentive home for the contagion. Even red sandstone, the true friend of the agriculturist, and which, we are told, possesses higher fertilising properties for every kind of vegetation than any other soil in northern Europe, is not without this scourge.

It is not unknown on Exmoor Forest, a high tract of country, many parts being as much as 17,000 feet above the level of the sea; the soil is here formed almost entirely from decaying vegetable matter. It can and does exist on every kind of soil, whether it is formed from Silurian, calcareous, or more recent formations, and at comparatively great altitudes above the sea. This latter fact fatally opposes our old theory of its origin, which is that we have removed the original home of the sheep (the high plateaux of the world) to low and damp situations, and hence we get a vitiated and unnatural secretion of horn, which we call Foot-Rot. I am willing to admit that this removal of the sheep is a predisposing cause of the disease, by rendering the horn soft, and in a condition suitable to be punctured and destroyed by such a parasite as Professor Axe describes.

The plantar surface of the foot is almost always the primary spot affected, generally speaking where a small portion of the wall overlaps the sole—in fact, where a few particles of soil containing the parasites could lodge and commence their work of destruction. I do not believe that a low or damp situation only will account for the disease, but it will render the hoof in a suitable condition for burrowing parasites to work on.

THE PATHOLOGY OF BURSATTEE.

BY F. SMITH, VETERINARY SURGEON, 12th ROYAL LANCERS, INDIA.

IN the year 1879, I brought to the notice of the profession certain facts which I had observed in studying Bursattee. I purpose in this short communication to briefly relate the result of my later labours in connection with the pathology of this peculiar disease.

Fig. 2.

The actual exciting cause of Bursattee is a mould-fungus, a drawing of which I attach (Fig. 2). I have found it in every

fresh specimen of the sore that I have examined, but I have not found it after the sore has been hardened by chromic acid. A fine section or scraping of a fresh ulcer should be placed on a slide and examined after the addition of a few drops of liquor potassæ and glycerine. On examination with a quarter-inch objective and a "B" eye-piece, the field is found intersected in every direction with the mycelium. The filaments, or *hyphæ*, are branched, non-septate, $\frac{1}{20000}$ of an inch wide, and so long that they cannot be followed as they pass in and out of the tissue. They converge and diverge, run parallel and transversely to each other, communicate freely by branched processes, and some filaments appear curly. I have seen in a few cases the terminal extremity of a *hypha* end in a rounded, bright, refractive body, very little, if any, larger than the filament itself; the nature of this is doubtful.

It will be observed that the mycelia of this fungus are very small; they appear under a power of 380 diameters as mere threads, and unless reagents be used they might be passed over. I have observed no spores, but I am at present engaged in the cultivation of this mould.

The drawing which I send (Fig. 2) shows the filaments larger than they really are under the quarter-inch objective, but this was necessary for the sake of clearness; it is most difficult in working to follow the threads, as they are so numerous. I should add that in the drawing the structure of the tumour has been entirely omitted, in order to prevent confusion.

These observations may with safety be accepted, as I have verified them over and over again. As the disease is one whose nature has given rise to much controversy, and as I claim to be the first to have seen and described the Bursattee fungus, I may mention that I have demonstrated its existence to the entire satisfaction of Veterinary Surgeon J. H. Steel, who is well acquainted with practical biology, and to Surgeon Major Sibthorpe, Professor of Pathology at the Madras Medical College.

I have lately produced typical Bursattee ulcers by inoculation with portions of tumour, and I am engaged at present working this out, and endeavouring to produce the sore from the cultivated moulds.

THROMBOSIS.

BY A. D. WEBB, A.V.D., 1ST ROYAL DRAGOONS.

THE following interesting case may be considered worthy of record in the VETERINARY JOURNAL. On lately taking over veterinary charge of the 1st Royal Dragoons at Newbridge, a mare was brought to my notice as being the subject of "fits," and as having fallen down on parade on several occasions. Very few days elapsed before I had an opportunity of seeing the said mare in one of these "fits"; she was brought in from parade, having fallen down four times; on return to her stable, she at once threw herself down. I was immediately called in, and found her down, rolling about and sweating profusely. I got her on to her feet and had her led out, and noticed that she moved the hind limbs with very great difficulty, more especially the left one. The entire absence of any perspiration on the hind quarters was very remarkable, the remainder of the body being bathed in it. The coldness of the hind quarters was also very marked; from these symptoms and the history of the case, I at once diagnosed it to be one of Thrombosis of the large arteries of the hind quarters, and decided to reserve my opinion until the following day; in the meanwhile, ordering the mare to be kept in the stable until I had her brought into the riding school for the purpose of being lunged, in order that I might see the symptoms develope themselves. On being led from her stable, she walked and trotted quite freely, nothing abnormal being noticed about the action of the hind limbs. I then started her on the lunge at a steady trot, which I kept up for five minutes; she then began to show great stiffness of both the hind limbs, the left particularly, the same loss of power being noticeable in the muscles of the tail. I then increased the pace to a canter for five minutes longer, which aggravated the symptoms very considerably; she was now pulled up, when she was observed to have an anxious expression of countenance, breathed laboriously, constantly shifting her weight from one hind foot to the other, sweating profusely, anterior of the hind quarters, over which there was no appearance of any perspiration. On placing one hand on the body and the other on the muscles of the quarter, the temperature of the latter

was found to be considerably decreased, this being more marked on the hand being passed down to the hock, which was deathly cold. I then had the bridle taken off, and left her to her own devices at the further end of the riding school; she appeared anxious to move, but was evidently afraid to do so, and only moved the fore extremities from one side to the other, keeping her hind feet a fixed point. All things considered, it required no great amount of deliberation to be quite satisfied that the case was one of Thrombosis of the large arteries of the hind quarters, and probably the femoral arteries to a great extent.

The mare was a well-bred animal in good condition, fourteen years old, and there was no appearance of any wasting of the muscles of the hind extremities; in fact, quite the contrary, the quarters being very muscular. In the stable there was no perceptible difference in the temperature of the hind limbs; the mare fed well, and appeared in good health.

I again had the mare lunged in the riding school for the inspection of the officers commanding the regiment, all the foregoing symptoms again repeating themselves. I recommended that the mare should be destroyed, as she was of no further service.

My recommendation having been sanctioned, the mare was destroyed this afternoon (June 2nd). The *post-mortem* examination was conducted by Mr. Hagger, A.V.D., Dr. Donovan, A.M.D., and myself. On opening the abdominal cavity, I passed my hand to the region of the posterior portion of the aorta, and at once found the correctness of my diagnosis, from the rope-like condition of that vessel; and on further dissection I found that all the blood-vessels of the hind quarters were in a similar condition, as you will see by the specimens I this day have forwarded to you, the arteries of the near hind limb being plugged up as low down as its bifurcation into anterior and posterior tibial, the clot commencing at about the last five inches of the posterior aorta.

This is the fourth case of this kind that has come under my observation, all of them being mares. The one previous to this was an old mare belonging to a friend of mine at Kirkee, Bombay —an animal I knew very well for a long time, she being celebrated

as a very fast trotter in harness; she had never been "sick or sorry" until one day she turned up suddenly lame behind, after being driven about a mile from her stable. About a month passed before I saw her, when I at once pronounced the case to be one of Thrombosis of the large arteries of the hind quarters. The owner handed the mare over to me, as I told him she was of no further use. The only difference in the two cases was that the Indian mare was much more violent on being put to any exertion. She would throw herself about in the most furious manner, utterly regardless of her own safety or that of any one near her, squealing and in every way giving evidence of the most intense agony I ever saw, for about half-an-hour, when all symptoms of suffering would entirely disappear. I kept her for about six weeks. She was then destroyed, the *post-mortem* examination being attended with similar results. The specimen I gave to Inspecting Veterinary Surgeon Charles Steel, for the Poona Veterinary School.

PARTURIENT ECLAMPSIA IN THE COW.

BY G. G. MAYOR, M.R.C.V.S., KIRKHAM.

HAVING recently had a case which presented in a well-marked manner the symptoms of this unusual disease, I have ventured to lay a brief account of it before the readers of the VETERINARY JOURNAL.

History, etc.—March 18th, my immediate attention was requested to a cow, lately calved, which, the owner feared, was "going down in Milk Fever." On my arrival at the farm I found my patient to be a valuable shorthorn, six years old, which had given birth to its fourth calf on the 9th, being a week past "her time." Parturition had taken place easily, the fœtal membranes came away very shortly, lochial discharge was established, and all appeared to be going on well until the 17th, when the owner observed that the discharge from the womb was checked, and the appetite and lacteal secretion were slightly impaired. Next day at noon, in addition to the foregoing indications, the animal was noticed to be "tottering behind," whereupon my attendance was requested. Shortly

before my arrival the cow went down. I should add that the animal had been bred on the farm, was of healthy stock, and in good condition.

Symptoms.—Animal laid in a fairly natural position; pulse 100 and irritable; respiration, dyspnotic and partially oral; eyes generally fixed in a wild, unmeaning stare, but occasional strabismus was present, and at times, when there were violent clonic spasms (particularly of the hind extremities), the eyes pirouetted rapidly. The surface of the body was rather cold, fæces scanty. Suddenly the animal sprang to its feet, and appeared as if immediately about to fall; then it threw itself violently backwards, somewhat in the position of a horse suffering from Acute Laminitis in the fore feet, and there was intense spasm of the extensor muscles, and violent trembling of the whole body. The vulva was unnaturally contracted, and dry in appearance, and the hand, on introduction to the genital canal, found the mucous membrane almost parched.

Gradually the acute symptoms subsided, though for some time the cow appeared as if about to fall. In the course of several hours she laid down, ruminated, and appeared anxious for food.

There were several more slight attacks, but none of anything like the severity of the first.

For some days the cow seemed weak, and the pulse was very variable in character, but there were no convulsions after the first twenty-four hours—at least, none were seen. Before the week end all appeared right, and has continued so. Lochial discharge re-commenced about the third day.

Treatment.—A brisk cathartic, with a large dose of chloral hydrate, was administered immediately, and injections, both rectal and uterine, the latter being carbolised. Mild, stimulating liniment was applied along the course of the spine, a wet bandage put on the head, and the animal warmly clothed. Subsequent treatment consisted in repeated small doses of Hyd. chlor., and Spt. æth. nit., with occasional injections as before. Diet for the first eighteen hours was confined to gruels, etc., afterwards light, easily-digestible food was allowed in small quantities oft repeated.

Remarks.—I should suppose that the exciting cause of this attack must have been a chill (from a door accidentally left

open) producing arrestation of the lochial discharge—at least, I could not discover any other circumstance about the case likely to have induced it, and the rapid recovery in the general health which took place after a few days, when the discharge was re-established, tends to confirm me in this view of the case.

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 173, *vol. xviii.*)

Rabbits, guinea-pigs, calves, pigs, goats, horses, dogs, cats, monkeys, and pigeons were experimented upon, and for the insertion of the supposed nosogenic principle various parts of the body were selected. Numerous inoculative procedures were invoked, and the matter selected for inoculation was used in different forms and after it had been submitted to varied preparation. It was inserted into the subcutaneous connective tissue, bronchi, the thoracic and abdominal cavities, as well as the blood-vessels; it was introduced into the trachea after it had been reduced to powder, and it was passed directly into the stomach by means of the œsophageal sound.

Notwithstanding this great divergency in the essential condition of the experiments, the general result was such, that *the transmissibility of Tuberculosis, by various channels, could no longer be a matter for doubt.*

The experiments which furnished negative results with regard to the contagiousness of this malady, could in no way affect the results of the experiments which yielded affirmative evidence, as in such investigations we cannot limit ourselves to enumerating facts, but must analyse and appreciate them. Is it not sufficient, when an experiment is made under irreproachable conditions, to establish a constant fact from a single positive result? Can negative results, counted by thousands, reverse an established fact? Evidently not.

In order to include at a glance the total of the experiments made, we shall present them as nearly as possible in the order in which we have given a *résumé* of the clinical facts.

Günther and Harms placed five rabbits in a cage, which they

suspended in front of the head of a tuberculous cow, in such a way that the rabbits were compelled to inspire the air expired by that animal. The autopsy of the rabbits did not reveal any alteration in their organs. The result was different when the animals were brought into contact with the expectorations from phthisical people. Tappeiner, in the experiments he made, and the results of which caused much sensation, found that the inhalation of matters expectorated by consumptive persons, even when in very small quantity, never failed to produce Pulmonary Tuberculosis in the dog, and, in certain circumstances, generalized Tuberculosis. The duration of the incubative period varied, in these cases, between nineteen and twenty-three days. According to this able experimentalist, the inhalation of scrofulous matter, or that derived from purulent expectorations from inflamed bronchi, will not produce Tuberculosis.

When these experiments were made, it was also sought to determine the action which the ingestion of such substances as the flesh and milk from tuberculous animals might produce on those who consumed them, and with this view experiments were undertaken nearly everywhere.

Johne,* in a very complete and learned work on the history of bovine Tuberculosis, gives the following *résumé* of the results of experiments made with the object of establishing this action :—

	RESULTS.		
Animals Experimented upon—	Affirmative. Per cent.	Negative. Per cent.	Doubtful. Per cent.
1 Horse	0·0	100·0	0·0
5 Calves	100·0	0·0	0·0
35 Sheep	51·4	42·9	5·7
13 Goats	84·6	15·4	0·0
60 Pigs	65·0	18·3	16·6
17 Rabbits	31·2	66·5	2·3
20 Dogs	25·0	75·0	0·0
9 Cats	55·5	44·4	0·0
6 Guinea-pigs	83·3	16·6	0·0
2 Pigeons	0·0	100·0	0·0
322	43·5	51·1	5·0

Of the 322 alimentation experiments, 259 were made with uncooked food ; and of these the affirmative results were 47·7 per

* "Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie," 1883, p. 32.

cent., the negative results 48·9 per cent., and the doubtful results 3·3 per cent. In 62 experiments aliment was employed which had been cooked for ten or fifteen minutes, and the following were the results : 35·5 per cent. affirmative, 64·5 per cent. negative, and 1 per cent. doubtful.

Classification of these experiments according to the alimentary substances employed, gives the following result :—

	RESULTS.		
	Affirmative. Per cent.	Negative. Per cent.	Doubtful. Per cent.
117 Animals fed with tuberculous matter from a heifer	61·5	34·2	4·3
46 fed with the raw flesh of tuberculous cows	13·1	86·9	0·0
91 fed with milk from tuberculous cows	30·7	59·3	1·0
1 fed with milk from tuberculous rabbits	100·0	0·0	0·0
25 fed with tuberculous matter from human beings	36·0	64·0	0·0
33 fed with tuberculous matter from a pig	53·0	47·0	0·0
2 fed with tuberculous matter from a sheep	100·0	0·0	0·0
2 fed with tuberculous matter from a rabbit	50·0	50·0	0·0
3 fed with tuberculous matter from monkeys	100·0	0·0	0·0
5 fed with tuberculous matter from birds	100·0	0·0	0·0

In reviewing these experiments and well-established clinical facts, Johne arrives at the following conclusions :—

1. The transmission of Tuberculosis may be effected from animal to animal and from man to animals, by the ingestion of tuberculous matters, but this mode of transmission is much more uncertain than that by inoculation ;

2. The matters which most certainly transmit Tuberculosis by gastro-intestinal ingestion, are those obtained from the lungs, the pleura, and lymphatic glands ; the milk of tuberculous animals, with regard to its more or less certain action as contagious matter, coming next to these. Infection takes place less readily with tuberculous matter obtained from mankind than with that from animals ;

3. Infection takes place less readily by the ingestion of flesh

than by means of the substances mentioned in 2, and yet it was employed successfully in seventy-six of the cases shown in the above table;

4. Calves, sheep, goats, and pigs present, as has been already mentioned, and as has been so well shown by Bollinger, the greatest receptivity for the tubercular contagium. With regard to the supposed immunity of the carnivora, it is not so definite as some authorities believe.

Among the experiments which specially merit our attention, we mention those made by Gerlach. Of 46 different animals submitted to experiment, and fed with *uncooked tuberculous substances*, 35 were infected; of 35 animals fed with *uncooked flesh* from tuberculous cows, 8 contracted Tuberculosis; and of 15 fed on *cooked* tuberculous matter, 10 became diseased.

Beside the experiments of Gerlach, we may cite those made by Bollinger.* The learned experimentalist employed the milk of tuberculous cows, which he gave to pigs, and the conclusions to which his experiments led him, in presence of the pathological preparations derived from them, was that *the prolonged consumption of the milk of tuberculous cows produced miliary Tuberculosis in the pig.*

The experimental inoculation of tuberculous matter into the *subcutaneous connective tissue, into the thoracic and abdominal cavities, and into the anterior chamber of the eye*, has given a relatively greater number of facts in support of the transmissibility of the disease than the ingestion of this matter. Subcutaneous inoculations have, especially with rabbits, generally produced results analogous to those arising from the insertion of non-tuberculous matters. The authentication of this fact has been the cause of long and violent discussions, which did not terminate until Cohnheim, Salomonsen, Hänsell, Deutschmann, and Baumgarten had recourse to intra-ocular inoculations on white rabbits with pink-coloured iris. On this organ the tubercular evolution can be closely watched, and it is observed that, after an incubation of twenty to thirty days, there appear nodules on it, this change being followed by general miliary Tuberculosis.

* "Versamlung deutscher Naturforscher und Aerzte," 1879, in Baden.

Baumgarten * injected into the anterior chamber of the eyes of a certain number of rabbits, some drops of blood from a recently-killed animal which presented very marked lesions of Tuberculosis, developed after inoculation. By means of these injections he produced a typical ocular Tuberculosis, which rapidly led to general infection. Tubercles appeared after three or four weeks in the inferior segment of the iris, close to the point where the blood had lodged. The number of these tubercles gradually became more and more numerous in the eye, and finally there supervened the manifestations and lesions of generalised Tuberculosis, which killed the creature. This experimentalist repeated these experiments with the blood of healthy animals, but there was no consecutive morbid result. The result was also negative in several cases in which he substituted for the blood of healthy animals, that of creatures affected with Septikæmia or some other malady ; in other cases the injection of such blood caused Ophthalmia of variable intensity, but never Tuberculosis.

Among recent experiments, we ought specially to mention those of Toussaint, Professor at the Toulouse Veterinary School. This observer has, by numerous experiments continued during several years, sought to demonstrate the contagiousness of Tuberculosis. For these investigations, which required thousands of animals, he employed pigs, rabbits, and cats, as the disease is more surely and rapidly developed in them. The fluid expressed from the lungs of a tuberculous cow was that which he employed. He injected 1·5 cubic centimetres into a pig, and to two rabbits ten drops of this fluid, which was nearly quite transparent. He heated the fluid to a temperature of 55° to 58° Cent. for ten minutes in a water bath, and inoculated four pigs and four rabbits with it. All these animals became tuberculous, and the four which had been inoculated with the heated material perished even more rapidly than the others. Of the four rabbits, one succumbed thirty-five days after inoculation, and the others between the 164th and 170th day after the operation.

Two rabbits were inoculated with tubercles from the lungs of a

* "Centralblatt für die Med. Wissenschaft." No. 15, p. 274.

pig which had been inoculated with the heated fluid, and killed three months afterwards. The rabbits were killed in about two months, and found tuberculous.

In another series of experiments, morsels of the flesh of a tuberculous pig were roasted in the flame of a gas-burner, and two rabbits were inoculated with the juice expressed from these. Two other rabbits were inoculated with juice from pieces of non-roasted flesh. The latter died 120 days after inoculation ; one of the former was killed on the fifty-sixth day, and was found to be tuberculous ; the other was alive when the report was published, but it was very emaciated.

In a third series of experiments, Toussaint employed nasal mucus, saliva, and the urine of tuberculous animals, for his inoculation experiments. Three rabbits were inoculated at the base of the ear with the transparent mucus that flowed from the nose of a phthisical cow. In about two weeks there appeared a tuberculous nodule at the seat of inoculation, and the *parotidean lymphatic glands* were tumefied. Seventy days after inoculation the rabbits were killed, and in their lungs were found tubercles, the majority of which were grey, and some were already undergoing caseation.

The inoculation of saliva from a tuberculous cow yielded the same result, only the lung tubercles were less developed. In injecting some drops of urine from a tuberculous pig, beneath the skin of a rabbit's ear, rapid emaciation ensued, and four months after inoculation the rabbit died. The lesions of caseous Pneumonia were noted at the autopsy.

Reviewing the facts acquired with regard to Tuberculosis, Toussaint is of opinion that if cows lodged together in a building frequently become tuberculous, the cause should be sought, not in the food, but in the action of a morbific principle.

Chauveau had already observed that heifers which feed out of the same trough become tuberculous whenever a phthisical animal is found among them.

If among animals which live in the same stable, and eat and drink out of a common trough, there are those affected with the disease, the possibility of transmission of the contagium to all of them ought to be admitted.

There is another fact which merits attention. Toussaint vaccinated tuberculous cows by making seven punctures around the vulva, and implanting therein the contents of a vaccinal pustule, developed on a perfectly healthy heifer. Eight days after inoculation the vesicles appeared, and with the serosity from them four rabbits and a pig were inoculated. Two of the rabbits were killed in two months. Both were tuberculous. The other two rabbits were alive at the date of report, but in such a state of emaciation as to leave no doubt as to the existence of the malady.*

From the clinical observations already cited, as well as the numerous experiments which have been made, tending, as they do, to establish the infectious character of the malady under consideration, it evidently results that *Tubercular Phthisis is a contagious malady, equal, in infectiveness, to Glanders and Contagious Pleuro-pneumonia.*

It is not only contagious in the ordinary acceptation of the word, but it is also transmissible by the milk and flesh of affected animals, if these matters are introduced into the digestive canal. *Contagion plays, in the propagation of this disease, a more active part than heredity, which very often does not sufficiently explain its frequency.*

Another question which may be raised here, is as to whether animal Tuberculosis is the same as human Tuberculosis, and if so, in what way they are related.

In attentively following the history of Tuberculosis in man, as we find it in the works of Waldenburg,† we are forced to recognise that physicians have been no more fortunate than veterinary surgeons in their attempts to clearly define the malady.

Until the eighteenth century, medical men had included under the designation of *Phthisis*, all the acute and chronic diseases of the trachea, bronchi, lungs, pleuræ, and lymphatic glands, whenever debility and emaciation accompanied these affections.

The existence of tubercles was more or less unknown to them. It was during that century—the epoch of the *renaissance* of

* "Compte Rendu de l'Académie," Tome 93, Nos. 5, 6, 7, 10, 15.
† "Die Tuberculose, Lungenschwindsucht und Scrofulose." Berlin, 1869.

anatomy—that physicians began to appreciate at their just value the pulmonary nodosities of Phthisis, which the majority of them had hitherto looked upon as *glandulæ*; but it was not until the second moiety of the century that Stark, in his description of the miliary tubercles of Phthisis, distinguished them from glands or *glandulæ*, and attributed them to a formation *sui generis*.

The English physician, Reid, from his researches arrived at the same conclusion.

At a later period—in the ten last years of the past century—Matthew Baillie not only ascertained that the groups of nodules or large nodosities were due to the confluence of miliary tubercles, but he also noted, in the most precise manner, the existence of tubercles in other organs than the lungs, and especially in the liver, spleen, kidneys, peritoneum, and cerebral envelopes. He also declared that the substance constituting the majority of the tubercles was a white, soft, cheesy material, which he qualified as scrofulous matter.

The works of Bayle and Laënnec, two French physicians, may be said to have served as a basis for the views now prevailing as to the nature of Tuberculosis. Bayle was the first to describe, under the designation of "miliary tubercles," the small nodules which, by their confluence, give rise to the formation of pulmonary *noyaux*, and he was the first who insisted on their progressive development. He says:—"Tubercles may be present in three different forms; they are at first firm, then they soften in their centre, which is transformed into a purulent, grumulous matter; finally, they are entirely destroyed by suppuration."

This physician also mentions the existence of nodules in the larynx, bronchi, tonsils, and mesenteric glands, and describes the ulceration of the mucous membranes produced by the softening of the tubercles. He declares that the nodules do not indicate a local affection, but that they are due to a special diathesis—the tubercular.

(To be continued.)

Editorial.

ACTINOMYCOSIS.

SINCE attention has been drawn to the existence of this mycological disease, through the medium of German and Italian medical and veterinary periodicals and, in English-speaking countries, by means of the VETERINARY JOURNAL, rapid progress has been made in its investigation, and particularly with regard to its geographical distribution. Since the announcement of its discovery in this country was made in the pages of this Journal, it has been found to prevail extensively in the United States and in our North American possessions; Jensen has recently described the appearance of the disease in an enzootic form among cattle at Nykjæbing, on the north side of the island of Seeland; and Nocard has still more recently reported the existence of the malady in France, a specimen having been sent to the Alfort Veterinary School from the Paris abattoir; and there is reason to believe that the geographical range of the affection will ultimately be found to be very wide. Though the bovine species is more especially liable to it, other species are not exempt, as our pages have frequently testified, and, as the present issue shows, swine are not exempt, if the observations of Duncker are well-founded. In this country, though first discovered in Gloucestershire, yet it appears to be more common in Scotland than elsewhere, and though no cases have been reported in Ireland, yet it can scarcely be absent from that island.

Much has yet to be learned with regard to the manner in which infection takes place, but now that the malady is being closely and carefully studied we shall, doubtless, soon be in possession of important information with regard to it.

One of the most recent writers on the subject—M. Firket, of Liege, Belgium—in the *Revue de Médecine*, confirms the fact that the anatomical lesions are due to the colonisation and development in the tissues of the *Actinomyces bovis*; that the disease spreads from one part of the animal to another by transference of the fungus, and that it can be similarly transferred to other animals, but that such propagation is limited to particular species of animals. As to the manner in which the parasite exerts its pathogenic action, much yet remains to be made out. It does not appear to produce "coagulation necrosis"; but, from a study of the earliest-formed colonies, Firket finds that the first effect of the vegetation is to induce cellular hyperplasia. It is as if the tissue-elements resented the intrusion of the parasite, which, however, mostly gains the upper hand, so that the issue is the formation of inflammatory and suppurating foci that characterise the disease. The frequent occurrence of the primary tumours in relation to the jaws and tongue, seems to indicate that the fungus gains entrance with food. Firket, whilst admitting that this is possible sometimes, points out that it will by no means account for all cases, since it implies a breach of surface in the buccal mucous membrane, which often does not exist. It is more probable that abrasions of the skin afford a way of contamination;

whilst cases have been recorded by Ponfick and others of Pulmonary Disease obviously dependent on the inhalation of the fungus. Pflug, as already noticed in this Journal, reports a case in which the lungs were invaded by a multitude of tumours containing the *Actinomyces*. And in the cases of Mammary Actinomycosis observed in the sow, it is more than probable that the parasite has been introduced into the milk canals and sinuses, possibly by the prickly parts of plants coming into contact with these glands.

Speaking of prognosis, M. Firket remarks that the disease, especially in the cervical form, is capable of being cured by energetic treatment, whilst if left alone the issue is invariably fatal. Surgical intervention, in the opening of abscesses, and scraping their walls and the walls of the fistula, is the only mode of dealing with a malady which he compares, not inaptly, to the Madura Foot Disease in man, due to the presence of the fungus *Chionphye Carterii*.

Rosenbach, in abscesses caused by the *Actinomyces* in man, has on several occasions obtained good results by the interstitial injection of a solution of carbolic acid—one part to ten of water.

When the bones are involved, as happens so frequently in the ox tribe, re-section of these must be resorted to, and in the case of these, as of the soft tissues, caustics and astringents must be freely employed.

In several respects Actinomycosis is a most interesting malady, and well deserves the attention of those members of the veterinary profession who have opportunities for studying it. Though many points in connection with it have been fairly well established, there are others which need elucidation, and it is to these attention should be more particularly directed.

MEMORANDUM ON THE "CAT-PLAGUE" IN AHMEDNAGAR, 1881, AND IN SIRUR, INDIA, IN 1883.

I.—*Ahmednagar*, 1881.

In 1881, Cholera prevailed at Ahmednagar from about the beginning of July till the middle of August. During the first part of this period a great and unprecedented mortality occurred among the cats of the city. About 750 cats were reported to have died between the 1st and the 25th of July, 1881. The precise date when the epidemic ceased is not stated. The symptoms of the disease, as somewhat meagrely described in the reports received, were as follows :—

"A day or two before the cat died it appeared inactive, took no food, and tried to find some cool place where it could rest. The throat of the animal became swollen and choked, and when it died it foamed at the mouth."

The dead animals were removed by the local Municipality to a distance from the city, and buried deep in the ground, in the vicinity of the Municipal night-soil depot.

2. The Civil Surgeon of Ahmednagar, Surgeon-Major R. H. Batty, was requested by the Municipality to examine the carcase of a cat which had died of the disease, with a view to ascertain the cause of its death ; but that officer suggested that a veterinary surgeon should be consulted in the matter, which fell within the province of veterinary science. Accordingly a letter

was written to Mr. W. Lamb, the inspecting veterinary surgeon, then at Poona, requesting him to state his opinion as to the nature and cause of the mortality among cats, and proposing to forward for his examination the carcase of a cat which had died of the disease. The symptoms of the disease as described to Mr. Lamb were those stated above, and on a consideration of them he was of opinion that the cats were probably suffering from the destructive malignant disease called Anthrax, which frequently attacks cattle, and for which there was no remedy. As regards the transmission of the carcase of a cat to him, he was of opinion that the *post-mortem* changes in the carcase would be too rapid to admit of his being able to arrive at a fair conclusion from an examination of it, after the lapse of time which must necessarily take place between the death of the animal and his examination of its carcase in Poona. He therefore suggested that the civil surgeon of Ahmednagar should be requested to communicate to him the result of his examination of the carcase of a cat recently dead, stating particularly whether the different organs of the body had an abnormal appearance, and more especially whether the spleen was much enlarged and dark in colour, the stomach empty and inflamed, and the blood-vessels distended with black, treacly blood. He also requested that a tablespoonful of blood taken from a dying or very recently dead animal should be sent to him enclosed in an airtight bottle so that he might examine it microscopically with a view to the discovery of organisms such as exist in the blood of animals affected with the Anthrax. If the disease was Anthrax, as he suspected it to be, the causes which originated it were, in Mr. Lamb's opinion, such as would undoubtedly affect human and animal health generally, and would on that ground render sanitary precautions necessary.

3. On receipt of Mr. Lamb's letter, the civil surgeon was requested to hold the necessary *post-mortem* examination, and to forward a spoonful of the blood of a cat affected with the disease to Mr. Lamb. This, however, does not appear to have been done. The late Mr. Veterinary Surgeon Knott is stated during his visit to Ahmednagar in August, 1881, to have examined the bodies of some of the animals which had died of the disease, but the results of the examination do not appear to have been reduced to writing.

II.—*Sirúr*, 1883.

4. On the 21st of June, 1883, the collector of Poona reported that the Mámlatdár of Sirúr had informed him, that from the 1st idem up to date 125 cats had died at Ghodnadi (Sirúr), and that the chief symptom noticed was vomiting. In forwarding the collector's letter to Government, the commissioner, C. D., Mr. Robertson, observed that Cholera was prevalent at Sirúr at the time, that similarly when in 1881 Cholera was prevalent at Ahmednagar there was a great mortality among cats in the city, and that if the deaths were due to cholera, precautions were obviously necessary in the disposal of the dead animals.

5. Upon this, Government directed that a *post-mortem* examination of the body of a cat that had died of the disease should be made. Surgeon A. K. Stewart, the medical officer attached to the Poona Horse, was accordingly requested by the collector of Poona to hold the necessary examination, but by the time the collector's letter reached Surgeon Stewart the epidemic among cats had ceased, and he was therefore unable to make a *post-mortem* examination. He, however, instituted inquiries on the subject of the epidemic among cats, and submitted a very interesting report, the substance of which is given below.

6. According to Surgeon Stewart, the disease among cats had, as far as he could ascertain, never before appeared at Sirúr. On the 19th May, 1883,

Cholera broke out at Sirúr, and about the 1st of June, cats died at the rate of twelve a day. Cholera ceased on the 22nd June, and the worst part of the cat epidemic was over by the 18th of the same month, although the disease continued to prevail among the animals to a slight extent for two or three weeks afterwards. Altogether, according to popular report, 300 cats died during the epidemic, *i.e.*, fifty per cent. of the total number of cats in the town. Surgeon Stewart examined nine individuals whose cats had died of the disease. Eight of them gave evidence of symptoms so resembling each other that he classes those symptoms as constituting one form of the disease. The case of the cat belonging to the ninth man he treats separately. This cat suffered from by far the most severe type of the disease, and the evidence of the man who owned it is particularly valuable, as he was the most intelligent of all the persons examined. The symptoms of the two types of the disease are thus stated :—

First Type (*eight cases*).

(i.)—The cat is first noticed to be ill. It rapidly becomes extremely restless, not sitting for any length of time in any one place, but shifting about. As it walks it staggers in its gait like a drunken man. Some of the cats cried very loudly and incessantly, which made the owners aver that they were in great pain. All food and drink are refused from the commencement of the illness till death, which seems to be the usual termination, although Surgeon Stewart heard of a cat, not included among the eight treated of in this paragraph, which had recovered after three days' illness. There are no cramps in the limbs, as evidenced by an absence of lameness. Vomiting sets in as a rule, although it did not do so in two out of the eight cases, the number of times the animals vomited varying from two to twenty times, or more. Great salivation and foaming at the mouth are invariably present. The matter vomited is usually yellow, but sometimes green, and in one case it was white. Throughout the illness there is no diarrhœa. All the people who handled their cats said that there was great heat and fever. As the disease progresses, and as far as Surgeon Stewart could discover, at a very early stage the features of the animals become pinched and shrunken, and the eyes sink in the head ; and this is such a marked feature of the disease that the owners of all the eight animals noticed it. Only one man noticed the state of the conjunctiva, and he said that he saw a yellow tinge. Gradually the cats either assume a comatose or lethargic condition, or else attacks of convulsions set in ; and after a time, varying from ten to thirty-six hours, death occurs, the cat either dying quietly or during an attack of convulsions. No cases of cholera had occurred in the houses of the owners of the eight cats, but in several instances such cases had occurred in the neighbourhood, within a few yards of the house. The owners of two out of the eight cats said that the animals changed colour, one of them, which was white, becoming somewhat darker, and some of the hair of the other, which was of a brindled sandy colour, becoming white. Five of the dead cats were put into dust-bins, one was buried by the owner, and two were left where they died.

Second Type (*one case*).

(ii.)—The cat, which was a very strong, black animal, was well when it was let out of the house at six o'clock in the morning, and by twelve o'clock that day, or within six hours, it was dead. It showed signs of illness shortly after re-entering the house, and vomited at least twenty times, the vomit being black like coffee-grounds. A thick slime ran from the animal's mouth, and it had two white, watery stools like congee-water. The eyes were

so sunken that it was only with difficulty they could be seen when open. The colour of the conjunctiva was not noticed. The animal was extremely restless during illness, moving about from place to place. It refused all food and drink, cried a little during the first hour of its illness but not afterwards, was not lame from cramps when it walked, but staggered in its gait and seemed quite stupid. It had no convulsions, and died quite quietly. The owner said that the cat was decidedly colder than was natural during illness, and that after death it became very rapidly cold. The colour changed from black to rusty brown, and so great was the change that the owner had to look at the animal twice before he could believe that it was his own cat.

7. On the whole, Surgeon Stewart is of opinion that the disease from which the animals suffered was a malignant epidemic disease of the most virulent type, resembling Cholera in some points, but in others much more resembling what one would expect to find in cases of Yellow Fever, a disease of which he has no personal experience, but in which acute atrophy of the liver forms one of the leading features. The precise nature of the disease can, however, be determined only by holding *post-mortem* examinations and by experimenting upon animals; and as the same disease assumes such different aspects in men and animals, Surgeon Stewart considers it to be of the greatest importance that the investigation should be entrusted to an expert who has a thorough knowledge of epidemic diseases affecting animals. Such an expert may possibly be able to decide whether the disease is that known as "charbonous fever without eruption," the only disease known to veterinary science which Surgeon Stewart can discover as closely resembling the one described above. This affection differs widely from Cholera in many of its symptoms, but the question of its identity can easily be set at rest by experimenting on cats in towns where Cholera is still lingering. A number of cats might be made to swallow the excretions from patients affected with Cholera. Some of them might in this way become infected with choleraic poison, and should they exhibit the train of symptoms described above in paragraph 6, a proof will have been obtained that the disease is Cholera, modified by its presence in the cat. And if it is established that the disease is communicable from human beings to cats, it would be highly probable that it would be communicable from cats to human beings.

8. In connection with the epidemic among cats, Surgeon Stewart mentions that a very similar disease attacked some of the cattle at Sirúr, principally young, healthy buffaloes. He examined three individuals who owned nineteen buffaloes and five cows between them. Of these, ten buffaloes and one cow were attacked with the disease, and died. All were young, healthy animals, only one being of medium age; and all were in calf, except one buffalo and the cow. Death occurred within from fourteen to eighteen hours. The symptoms were panting, salivation, running from the nose and mouth, restlessness in some cases, and rapid death. Diarrhœa, eruptions, or jaundice tinge of the eyes were not present. Six of the animals were attacked between the 18th and 21st of July, one was attacked on the 23rd idem, one on the 28th idem, one on the 29th idem, one on the 2nd August, and one on the 7th idem.

KOCH ON TUBERCULOSIS.*

THE first volume of the "Mittheilungen"—a work comparable to the scientific reports which are issued in connection with the department of our medical officer of the Local Government Board—issued three years ago, was largely occupied with the admirable researches of Dr. Koch and his colleagues upon Anthrax and Septicæmia. The volume just issued,† of nearly 500 pages, exhibits a more varied character, but the chief place is given to the subject of Tuberculosis. Diphtheria, Typhoid Fever, and other affections in which micro-organisms play a part, are also dealt with in various papers, but the main interest, we believe, will centre in this question of tubercular disease. It is treated of in the opening paper, on the Etiology of Tuberculosis, by Dr. Robert Koch, a work completed by that scientist on the eve of his departure for Egypt; and it appears also in papers on the Mortality in Phthisis, by Dr. Würzburg; on the Occurrence of Bacilli in the Sputum, by Dr. Gaffky; and on the Disinfection of Phthisical Sputa, by Drs. Schill and Fischer. In the present notice we propose to confine our survey to Dr. Koch's article.

In his opening remarks Koch points out that the doctrine of Tuberculosis being a communicable disease is based on clinical observation, on anatomical facts, and on experimental research. The results of the first of these are inconclusive and uncertain. As to the anatomical facts, Buhl's doctrine of infection from caseous foci has been supported by the discoveries of Tuberculosis in the thoracic duct by Ponfick, and in veins by Weigert, and many other facts, which need not be further alluded to, upon the supervention of Acute Miliary Tuberculosis. On the experimental side the infectivity of tubercle was shown by Klencke in 1843 (but his work has been forgotten), and later by Villemin, whose researches stimulated so many and such contradictory experiments by others, but chiefly by Cohnheim and Salmonsen, in the results of their inoculations of the eye. The doctrine thus established, it became necessary to inquire into the nature of the virus; and the discovery of a micro-organism (the Bacillus Tuberculosis), with the study of its properties, have resulted in the accumulation of so much evidence that all that the most extreme sceptic can now assert is that the bacillus is a concomitant, and not the cause of the disease. Therefore, to prove that it has a causal connection, it had to be shown, as in the case of Anthrax, that the organism, after isolation and cultivation, could reproduce the disease when inoculated in the body.

After this introduction he proceeds to relate, with that remarkable clearness and accuracy that stamp all his work, the methods employed for the detection of the bacillus in tubercular tissues and their products, its relatively small size necessitating the employment of special processes of staining, which he describes. He points out that of all bacteria, none of those which most approach the tubercular bacillus in size take on the staining (methyl-blue), except the bacillus lepræ; but he justly adds that it would be a great error to assert that the etiological importance of the bacillus rests solely upon such colour-tests. It is not unlikely that other reagents will be found to stain these bacilli, and he notes that Ehrlich's process has already been much modified, especially by Ziehl, with more or less success in this direction. The colour fades rapidly, but it is not difficult to re-stain the preparations.

* From *The Lancet.*

† (Mittheilungen aus dem Kaiserlichen Gesundheitsamte. Herausgegeben von Dr. Struck, Geheimen Ober-Regierungsralte, Directer des Kaiserlichen Gesundheitsamte. Zweiter Band.) Berlin: Hirschwald. 1884.

He then describes the distribution of the bacilli in the tuberculous nodules; a distribution which varies much in amount and extent, even in the same case. In miliary nodules bacilli are to be found lying between and in the cells, which soon break up, the bacilli also being destroyed or yielding spores which resist the staining agent. Most remarkable is their relation to the "giant cell," which is almost invariably the seat of one or more bacilli, even if these latter be absent from other parts of the tubercle. The probability is that the bacilli gain entrance into "Wander-cells," which become stationary and take on epithelioid and "giant" forms under the action of the parasite. The giant-cell generally endures longer than the bacillus; but if the invasion of the bacillus is great, the cell may break up and rapidly degenerate. The further changes of the tuberculous nodule are wholly regressive—it caseates, and the bacilli soon disappear in the cheesy product, or it shrinks and becomes fibrous. The formation of spores is also described.

The next section deals with human Tuberculosis, and first with Acute Miliary Tuberculosis, of which nineteen cases were thoroughly examined, bacilli being found in all the tubercular nodules, most richly in those of more recent formation. There they are described in the lungs, liver, and spleen, in pia mater (very abundantly between masses of epithelioid cells around the small arteries), in the ocular choroid and elsewhere, and brief details are given of most of the cases. Next Pulmonary Phthisis, of which twenty-nine cases thoroughly examined yielded the bacillus in all—most abundantly in recent caseous infiltrations and within the walls of rapidly-forming cavities, most sparsely in the fibroid variety. Their number varies in different parts of the same lung. No doubt they are disseminated by the cell infiltration, and they would seem to directly cause the disintegrating process, the advance of which supplies them with fresh soil for their continued vegetation. They may be distributed through the lymphatics or blood-vessels, or by means of the sputum over the larynx and intestine, setting up tubercular changes therein; and the inhalation of the contents of cavities into other parts of the lung is, no doubt, a fertile cause of the local extension of the disease. The occurrence of bacilli in the sputum is quite diagnostic, and they may be readily distinguished from other bacteria which occur in the saliva, or in connection with putrefactive changes in the vomicæ. They also occur in the stools in Intestinal Tuberculosis, and in one case Gaffky found another but larger bacillus giving Ehrlich's reaction in these excreta.

In a third section the occurrence of the bacillus is described in Tuberculosis of various organs; in two cases of Tubercular Ulcer of the tongue, in four of Renal Tuberculosis, in one of the bladder, and one of the uterus. In five cases of Tubercular Testis, bacilli were sparsely found, and in two cases of solitary tubercle of the brain. Then comes a section devoted to their occurrence in scrofulous glands. Twenty-one cases were examined, the bacillus occurring in the giant cells, but rarely in the caseous mass. In thirteen cases of tuberculous disease of joints, three of hip, five of knee, three of elbow, one of foot, and one of finger, the fungous granulations contained bacilli; and in ten cases of bone disease (three carpus, five tarsus, two Vertebral Caries) bacilli occurred in all but one, where the pus from Spinal Caries was examined with negative result; but inoculation experiments confirmed the tubercular character of this case. Seven cases of Lupus were examined, and in all, although with marked scantiness, bacilli were found in the giant cells of this formation. Inoculation experiments with Lupus tissue produced Tuberculosis in the rabbit.

Having thus surveyed the tubercular affections of man, Koch passes to those of animals, and he remarks that, although no warm-blooded animal is proof against the virus, yet the form of the lesions differs in different species. Thus, in the guinea-pig, the liver and spleen are the seats of extensive ne-

crotic change without caseation ; in the monkey, there is rapid softening, with suppuration, of the tubercular masses ; in man, caseation is the main outcome ; in the "Perlsucht" of cattle, calcification and caseation ; and in the fowl, large tumours infiltrated with lime salts. In spite of these morphological differences, the disease is in essence the same; and the bacillus is to be met with in all its forms. He specially describes the seat and distribution of bacilli in tubercular disease of cattle ("Perlsucht"), of the horse, pig, goat, and sheep, of the fowl and monkey. He notes the rarity of spontaneous Tuberculosis in the guinea-pig and rabbit, unless under conditions suitable for contagion. For, previous to experimentation on this subject, he had hardly met with the disease in the many hundreds of such animals examined, until some part of the laboratory was devoted to the creatures which were inoculated ; then Tuberculosis appeared amongst others which were not inoculated. The "spontaneous" disease differs from the "artificial," in these animals, in being limited to a few foci in the lung, instead of having a wider dissemination. A section is then devoted to the artificial production of Tuberculosis in animals, and the variety of appearances produced. This portion of the work, which is most richly illustrated by many beautiful chromo-lithographs, closes with a summary, which may be thus briefly paraphrased. In all morbid products which, from their mode of growth, histological characters, and infective properties, may be regarded as truly tuberculous, certain rod-shaped bodies, reacting to special staining agents, are to be found. This is true of animal as well as of human Tuberculosis, and the number of separate observations is large enough to infer that the association is constant. Even in the two exceptional cases in which the pus of tuberculous abscesses (one spinal, the other renal) contained no bacilli, the probability that the diseased source of the pus contained bacilli amounted almost to certainty. These bacilli have never been found in other diseases, and statements to that effect must be set down to erroneous observation or incorrect application of methods of research. The bacillus occurs in the very earliest formations ; it seems to induce cell-accumulation, giant cell formation and ultimate destruction of these elements. The presence and number of bacilli are undoubtedly connected with the rapidity of the progress of the disease. These facts point to more than a merely concomitant relation, and necessitate the further study of the life-history of the bacillus, which can only be done by methods pursued in the investigation of other bacterial diseases, by isolation of the organism and its cultivation outside the body. To this subject he then applies himself, and we regret that space does not permit us to detail the methods employed for this purpose. After that he describes at length the infection experiments—first, those made by inoculation with tuberculous tissues ; and, secondly, those made with pure cultures of the bacillus. These latter include inoculation of the anterior chamber of the eye, of the peritoneal cavity, intravenous injection, and experiments of inhalation. We know the results of this research, and how upon it the doctrine of *contagium vivum* in Tuberculosis has been based.

In conclusion, we should like to dwell upon the final pages of this monograph, in which the whole bearings of these researches are summed up. The fact that the tubercular bacillus can only grow under certain conditions (in blood serum and flesh infusions, and at a temperature above 30° C.), which are only obtainable in the living body—that it is, in fact, a true parasite, and not an occasional parasite like the Anthrax bacillus—is so far encouraging, as affording more hope from prophylaxis. Nor is there any evidence that a harmless, non-pathogenic bacterium can ever develop into this specific kind ; but there is also little ground for hope that the virus can be "attenuated." The bacillus has been shown to retain its infective properties for

very long periods, even in the presence of decomposition. Pulmonary Phthisis and Tuberculosis of the domestic animals are the diseases which maintain the contagium, and in Phthisis the sputa form the chief medium of transference. No doubt the bacillus is inhaled with dust, and, like dust, may remain in the air-passages, or be taken into the alveoli ; but its further development depends upon many conditions, one of which is its slow growth. Under certain circumstances, when the bronchial mucous membrane is denuded (as in measles), or when, from adhesions, defective formation of chest walls, etc., there is a tendency to stagnation of air and accumulation of secretion in parts of the lung, there is greater likelihood of the parasite taking root. But it is quite possible that the bacillus may sometimes gain entrance into the body in other ways—*e.g.*, in water, since it has been found in the intestinal evacuations ; and he believes cases of lymphatic tubercle are often due to the virus gaining entrance through abrasions. The second source of the tubercular virus concerns its entrance with food, as in consumption of the flesh or milk of tuberculous animals. That this is far less frequently the source of human Tuberculosis seems clear from the comparative rarity of primary tubercle of the alimentary tract ; and it seems also, from facts of intestinal infection in cases of Phthisis, that this requires the introduction of spores, which resist the action of the digestive juices more than the bacillus itself. The same applies to milk, and, moreover, this secretion only contains bacilli when the mammary gland is itself tuberculous, which is rare. When the bacillus has gained entrance into the body, whether by wounds of the skin, by inhalation into the lungs, or by the alimentary tract, it excites cell-formation, and subsequent necrosis where it lodges ; and the morbid process extends probably through the medium of the "Wander-cells" of the tissue, until the action of the parasite they convey brings them to a stand ; and wider extensions are readily explained by means of the lymphatic and blood-streams. The identity of the various forms of tubercular disease in man must be admitted ; and although positive proof is yet wanting, it is right to act on the doctrine that the human disease is identical with that which is manifested so variously among the lower animals. Differences in the manner of invasion, in the organs affected, and in the proclivity to the disease, must be attributed to individual predisposition, and to the conditions surrounding each case. Often such "predisposition" is explicable on anatomical grounds ; and it is to be noted that the disposition to become the seat of the disease may vary at different periods in the same individual. As to heredity, for which little support is given in the rare occurrence of congenital Tuberculosis, Koch briefly dismisses it as an argument against the infective theory, by asserting that it is the "disposition," and not the disease, which is transmitted. This infective theory, he repeats, is not new ; it has only been confirmed by these researches. Its acceptance, and the evidence that Tuberculosis is dependent on a parasite, demand energetic study of therapeutic and prophylactic measures, although on the former head there is less reason to hope for success than on the latter. But, although prophylactic measures are needed, the wide distribution of the disease requires that all endeavours in this direction should take into account social relations, and one must carefully inquire in what way and how far such measures may be carried out without undue disturbance and injury. He reserves for another time the further development of these considerations.

THE BACTERIA OF SWINE PLAGUE.

BY E. KLEIN, M.D., F.R.S.

IN a paper read before the Royal Society on February 17th, 1878, I have described in a summary way the results of observations on the etiology of an acute infectious disease affecting swine to a very large extent in this and other countries—Swine Plague or Swine Fever, Pig Typhoid or Pneumo-enteritis, or Hog Cholera. I have shown that the lungs, intestines, and serous membranes are constantly and severely diseased, and that particles of these organs are capable of starting the malady by inoculation into healthy pigs. I have also shown that infection is easily carried out by means of the air, and that the essence of the virus is a rod-shaped micro-organism, a bacterium; this I had cultivated artificially outside the body of animals, and with such artificial cultures I was able to produce infection. The bacterium, as cultures had proved to me, belonged to the species of bacillus, motile, very minute, and capable of forming spores.

In a detailed memoir (*Reports of the Medical Officer of the Local Government Board*, 1877-1878) I have given a minute account of the pathology and etiology of this disease, and have there also stated that it is capable of transference by inoculation to some rodent animals, notably tame mice and rabbits. In 1882 M. Pasteur published the results of observations on this malady in France (*Comptes rendus*, No. 23, 4th December, p. 1,120), maintaining that the essence of the virus of Swine Fever (mal rouge, rouget) is not a rod-shaped bacterium, but a dumb-bell of micrococcus, similar to that of Fowl Cholera: "Sa forme est encore celle d'un 8 de chiffre, mais plus fin, moins visible que celui du cholera (des poules)."

That in Swine Plague micrococci do occur very abundantly as dumb-bells and as zoogloea, of that fact I was well cognisant, and I have minutely described their occurrence in the ulcerations of the large intestines, the lung and pleura, in the ulcers of the tongue and larynx (*Reports of the Med. Off. of the Loc. Gov. Board*, 1877-1878), but I have not attributed to their presence any but secondary importance.

In a second communication, M. Pasteur (*Comptes rendus*, No. 22, November, 1883, p. 1,163) tells us that the microbe of the Swine Fever was discovered by his assistant, the much lamented M. Thuillier—whose very beautiful researches with M. Pasteur on the bacillus Anthracis justly won him the estimation of his French and foreign colleagues—in cultivations made from the blood of pigs suffering from Swine Fever; that this organism is a dumb-bell of micrococcus (*en chiffre* 8); that cultivations in beef-broth yielded a virus which produced Swine Fever; that rabbits and pigeons are very susceptible to this disease—in fact, in some departments of France these have died out through infection from swine; that rabbits inoculated with the cultivated virus die, that also pigeons inoculated with the virus die under exactly the same symptoms as when inoculated with the micrococcus of Fowl Cholera; that when the cultivated virus (*le microbe du rouget du porc*) is passed through several rabbits in succession it becomes attenuated, not as regards rabbits, but as regards swine; so much so that using it now to inoculate pigs, it will be found that while they bocome slightly ill, they nevertheless do not die, but remain immune against the virulent disease.

These are in substance the assertions made by M. Pasteur; they are, as is evident to every worker in this field of the relation of micro-organisms to infectious diseases, of the greatest importance. It is therefore greatly to be regretted that M. Pasteur has not embodied in his paper the details of his observations, for on analysis it will be seen that beyond his bare assertions, which no doubt appear to him quite justified from his observations, there is

for the worker nothing to go by. It is exceedingly difficult to judge what he really has observed. There is no description given of the pathology of the disease in rabbits as compared with that of the pig and pigeon, there is no description given of the malady provoked by his attenuated virus, nor of the test to which he subjected the pigs inoculated with his attenuated virus, *i.e.*, the virus that had passed through a succession of his rabbits, beyond the publication of two letters by the owners of the "vaccinated" animals that these animals have not succumbed to the malady, although others in the same district, not previously inoculated, had succumbed.

It is impossible to say whether these rabbits had really the Swine Fever, or died merely from septicæmia. It would have been important to find, also, a statement what the mitigated malady in the pigs, inoculated from those rabbits, was : what was the course of the temperature ; was there any swelling in the glands near the seat of inoculation? I have seen a good many pigs inoculated with culture of the bacterium of Swine Fever, which, beyond the swelling of the glands and beyond a transitory rise of the body temperature on the second and third day, by one or even two degrees C., showed no other signs. Had I omitted to inspect the glands near the seat of inoculation, and had I not taken the temperature regularly, I should have been unable to recognise the malady.

At the outset it seemed to me probable that, as in the case of the microbe of Fowl Cholera, M. Pasteur did not work with pure cultivations of the microbe of the Swine Fever, viz., that he worked with cultivations in which there were very probably the specific microbes and an accidental contamination, probably a dumb-bell form of micrococci. The first, *i.e.*, the true microbe of Swine Fever, M. Pasteur has overlooked, as I shall presently conclusively prove, the other he has seen and taken for the specific microbe. This other or accidental microbe is probably the microbe of Fowl Cholera, or a similar organism. For how is it, I would ask, that the pigeons that he inoculated with his cultures died under symptoms and with anatomical lesions identical with those of Fowl Cholera, whereas *all inoculations of pigeons* that I have made with virus directly derived from the diseased swine—diseased lung, diseased bronchial glands, *i.e.*, virus which invariably produces the disease in swine and in other susceptible animals—and with my artificial cultures of the organism of Swine Fever, *produced absolutely no effect, neither local nor general?* Surely only because the cultures that M. Pasteur experimented with contained something different from, something additional to, the virus of Swine Fever. Had Pasteur inoculated pigeons directly from the pig, ill or dead from the disease, which he, strange to say, omitted to do, he would have at once convinced himself that pigeons are not susceptible to Swine Fever. That his rabbits may have died from the Swine Plague is possible, but it is more probable that, like his pigeons, they died of a septicæmia produced by the *microbe en chiffre* 8. This M. Pasteur ought to have taken into account, particularly by reason of his previous observations of the great susceptibility of rabbits to a microbe of this kind, which he cultivated from saliva of a child suffering from Hydrophobia, and which microbe he thought, quite erroneously, as is now well known, to be the virus of Hydrophobia.

Of the rabbits which died in consequence of inoculation with his cultures of the microbe of Swine Plague, no description whatever is given, neither are the symptoms of the disease nor the anatomical appearances found after death.

That rabbits are susceptible to the disease, this I had proved in 1877 by inoculation with material directly derived from the pig, and I have described in detail the pathological appearances presented by these animals.

In the same memoir I have also given a detailed description of experi-

ments on mice—which are still more susceptible to this malady—both after inoculations with the virus directly derived from the pig, as well as with the artifically cultivated virus.

Of a microscopic examination of the tissues of the animals dead of the disease there is of course no mention made, a proceeding which M. Pasteur appears to consider as altogether superfluous.

Owing to these statements of M. Pasteur I have made many new experiments of artificial cultivations of the micro-organism of Swine Fever, and I will describe here the results of these experiments, and also of new observations made on the diseased organs prepared with the new methods of anilin-staining. In this last part of the inquiry I have been very ably assisted by my friend Mr. A. Lingard, to whom my best thanks are due.

These observations were made incidentally to my work on air-disinfection in Swine Fever, which work I am carrying on for the medical officer of the Local Government Board, in whose reports these experiments will be published in detail.

1. *Examination of diseased organs of pigs dead of Swine Fever.*

(*a*) As I have mentioned in my former report, in the bronchial exudation, in the juice of the lung tissue, in the peritoneal exudation, and occasionally, but not generally, also in the blood, minute rods can be seen already in the fresh state. Preparing sections through the typically ulcerated mucous membrane of the large intestine, staining these in anilin dyes, and examining them under the microscope, I find this: In the superficial parts of the necrosed membrane are present large numbers of micrococci of various kinds, chiefly varying in the size of the elements and in the mode of aggregation, some being small, and forming an irregular zoogloea, others being two and three times larger and aggregated in small clumps. These micrococci stain well in Spiller's purple and in methyl blue, and are present only in the necrotic parts of the ulceration, in which they appear irregularly distributed. But in the depth of the tissue, and extending in many places into the inflamed submucous tissue, are seen streaks and clumps of minute rod-shaped bacteria, which coincide as regards size (length and thickness) with the bacilli which I described in my former memoir, the single organisms being about 0·001 to 0·004 mm. long, and about a third or a fourth as thick. They are occasionally seen forming a chain or linear series. In some places they lie closely together in groups, and many are seen in optical section, and then it is necessary to be careful not to confound them with micrococci. They stain well and conspicuously with magenta.

(*b*) Sections made through the fresh or hardened swollen mesenteric and inguinal lymph-glands, and examined in the same manner as the intestine, reveal the presence of clumps of the same minute rod-shaped organisms as in the intestine. They are chiefly aggregated in a peculiar manner; in a few places they are scattered irregularly through the tissue, but are chiefly contained in what appear to be capillary vessels and minute veins. Looking at a clump of these organisms, one imagines them at first to be a zoogloea of micrococci, but using oil-immersion lenses and Abbe's substage condenser it becomes certain that they are undoubted rods, some smooth and uniform, others more or less beaded. As a rule, when one has before one a small blood-vessel filled with them and cut across, the rods look like dots, but in a vessel cut longitudinally or in the tissue itself there is no difficulty in ascertaining that they are distinct rods.

(*c*) Sections through the diseased parts of the lung reveal in preparations stained as above, the presence of large numbers of micrococci in the cavity of the bronchi and air vesicles, but not in all lungs, since I have found lungs in which they were altogether absent. But there are always present in smaller or larger clumps the same minute rod-shaped organisms as mentioned above.

They are embedded in a coagulum filling the air vesicles or they block up a blood-vessel in the wall of a bronchiole or air vesicle. In the air vesicles I have seen exudation cells, white blood corpuscles containing clumps of the rods ; they are well brought out by Spiller's purple. In the air vesicles of some lungs I have seen them grow to very long chains,—leptothrix, ten, twenty and more times the length of the single rods. These rods were present not only in the air vesicles, but also in the tissue itself, both of the walls of the air vesicles as well as of the smaller or larger bronchi.

(*d*) In sections through ulcerations of the mucous membrane of the tongue—these ulcerations do not occur commonly in Swine Fever, but in isolated cases I have seen and described them, as well as ulcers in the larynx (see my *Report to the Med. Off. of the Loc. Gov. Board for* 1877)—I have seen in the superficial parts of the ulcers large clumps of micrococci, but in the depth of, and extending between the inflamed muscular tissue, I have found the same rod-shaped organisms as mentioned above ; they are chiefly in spaces between the bundles of the inflamed connective-tissue, forming here streaks of longer or shorter chains.

2. *Examination of diseased tissues of mice and rabbits.*

In the juice of the diseased lung, in that of the liver and spleen, the minute rods can be seen already in the fresh state, in the heart's blood only occasionally. Sections through the diseased organs (spleen and liver) of mice and rabbits dead of this disease, produced either by inoculation with the virus of diseased organs of the pig, or with the diseased organs of a mouse or rabbit dead of this disease, or with artificially cultivated virus, show on microscopic examination the presence of the same rod-shaped bacilli mentioned as present in the organs of the pig. The juice of the enlarged spleen of a mouse or rabbit (see below) reveals already in the fresh state, but still better in preparations made after the Weigert-Koch method of drying a thin film of the juice on a covering glass and staining with Spiller's purple, or better still with gentian violet, the presence of beautiful minute bacilli ; they are also well seen in sections through the spleen and the diseased parts of the liver. As I shall presently mention, the liver of mice dead of the disease is in most instances altered in a very striking and characteristic manner, there being present large numbers of minute whitish specks and streaks more or less confluent and chiefly due to coagulation—necrosis of the liver tissue. These changes are especially abundant near the anterior margin, so that often the tissue of this part is almost entirely necrosed. In the earlier stages masses of the liver cells near the central vein of the acini are necrosed, later on also the capillaries between them become transformed into hyaline or fibrous bands. In these necrosed parts we find in some cases the blood-vessels—capillaries and small veins filled with continuous masses of micrococci, staining readily with Spiller's purple and methyl blue, but in sections stained, *in addition, with magenta* we found scattered amongst the micrococci, especially at the margin of the necrosed parts, beautiful masses of the same rod-shaped organisms as mentioned above, either singly or in chains of two, three, and four, or in small groups. This fact is so striking that even a superficial observer cannot help noticing it. Single rods, or two or three, are found also independent of blood-vessels, between and in the liver cells themselves. They measure between 0·002 and 0·005 mm. In other cases no micrococci are to be seen, but the liver cells of the necrosed parts, or those at the boundary of necrosed parts, contain beautiful groups of the rods ; they stain well in an alcoholic solution of magenta.

I have seen the same rods, singly and in small clumps, in the Malpighian corpuscles of the kidney ; the capillaries of the glomeruli are impermeable, being transformed into hyaline or slightly fibrous bands.

3. *Artificial cultivations.* I have made the following artificial cultivations.

(*a*) A capillary pipette recently made and drawn out at one end into a very fine point like a needle, is pushed with this end well into the diseased organ, lung of pig a short time dead of the disease, or into the bronchial gland of the pig, or better still into the spleen or liver of a mouse or rabbit recently dead of the disease; the surface of the part to be used is previously washed after Koch's method with a solution of perchloride of mercury deadly to all micro-organisms. By squeezing the part a small quantity of juice is easily pressed into the capillary pipette. This is then withdrawn, and the fine pointed end is pushed through the cotton wool plugging the mouth of a test-tube containing sterilized material to be inoculated with the fluid. Cotton wool, test-tube, and nourishing material are reliably sterilized.

The cotton wool plug is before inoculation just slightly drawn up, but not lifted out, and immediately pressed down again into its former position, when after inoculation the capillary pipette is withdrawn.

As nourishing material there are used: chicken broth, rabbit broth, solution of peptone (two parts of beef peptone, two parts of cane sugar in 100 parts of distilled water), fluid Hydrocele exudation, solid Hydrocele exudation (solidified by evaporation), Agar Agar and peptone (solid). Of these materials I found for this and similar cultures of the organism of Swine Fever, such as will be presently described, chicken broth, rabbit broth, peptone solution and solid Hydrocele exudation very suitable, the others not quite so good.

(*b*) From blood of a diseased pig. A pig had been inoculated with an artificial culture, which as tested on mice and rabbits contained the active virus. The temperature of the pig rose twenty-four hours after inoculation from 39° to 39°8, after forty-eight hours it rose to 40°2; in this stage blood was obtained from the vein of the ear and with this blood eight test-tubes with sterilized nourishing material were inoculated in the manner above stated. After exposing the test-tubes in the incubator for several days, no growth of any kind of organism made its appearance. The temperature of the above pig fell on the fourth day to 39°8, but on the fifth day rose again to 40°4. On this day again blood was withdrawn and with it inoculations of artificial cultures were made, but with no success. After several days' incubation at a temperature of 35° C. no growth whatever had made its appearance. [That the fluids inoculated with this blood were suitable for the growth of the organism of Swine Fever, is proved by the fact that these same tubes were afterwards inoculated with cultures containing the organisms, and of course a copious crop was the result.]

(*c*) I have been more successful with the blood of rabbits ill with, or dead from the disease. But I have had failures in some cases. In the first instance the pointed end of a capillary pipette is inserted into a vein, in the second, the pericardium is opened, the pointed end of a capillary pipette is pushed through the wall of the right ventricle or auricle into the cavity of the heart, and a quantity of blood is thus obtained.

The inoculation of sterilized material in test-tubes is then performed as above. In many instances, after incubation for twenty-four hours, I have obtained a copious growth of the organism of Swine Fever. But in other instances the inoculation with blood did not produce any growth.

In all instances of successful inoculation, the fluids inoculated and kept in the incubator at 30-42° C. (best at 35-40° C.) became after twenty-four hours uniformly turbid, there being present multitudes of minute rods, actively moving, spinning about, darting to and fro.

An exception was met with in the cultures made from the diseased lung of the pig, for in these there were present, besides the typical rods, also numbers of micrococci and some long thin bacilli.

I have made successful inoculations by the dozen, and have found invariably the same organism: minute rods, in active motion, such as is observed

in the case of septic bacterium termo and of bacillus subtilis. M. Pasteur has entirely overlooked this organism, otherwise he could not have failed to notice its motility. Most of the rods are single, some are double, one placed behind the other, or sometimes these are found in a chain. They are rounded at their ends. In length and thickness they coincide with the rods described above as found in the tissues of animals dead of the disease.

After forty-eight hours' incubation the number of the rods is increased, and there is to be seen at the bottom of the fluid a small amount of a whitish precipitate, made up entirely of the rods, but not moving. After three or four days' incubation the fluid is still uniformly turbid, but the amount of deposit is increased, and there is an indication, on the surface of the fluid, of a pellicle, in the shape of minute whitish specks closely placed and confluent in many places, especially where the fluid is in contact with the glass.

This pellicle consists of moving and non-moving rods, some twice, thrice, and four times as long as others. Some are 0·005 mm. long.

On the sixth day of incubation the number of rods increases, the amount of bottom deposit is greater, and the pellicle on the surface is more distinct and coherent. In the fluid are only a few moving rods; this condition is still more pronounced on the seventh and eighth day, there being now hardly any moving rods visible.

The longer rods include either at one end or both, or sometimes also in the middle, a bright granule having all appearances of a spore, the rods themselves being composed of a very pale substance.

Fresh cultivations are made with these cultures; they are all successful, and give precisely the same results. The pointed end of a capillary pipette is pushed through the cotton wool plug of one of these test-tubes into the fluid, a small quantity ascends into the pipette, the pipette is withdrawn, and with it a second, from this a third, from this a fourth, from this a fifth cultivation is established.

The rods we have to deal with in these cultures cannot be bacterium termo, since they are twice and three times as long as the known bacterium termo; besides, the larger examples are really single rods, since staining them with anilin dyes does not reveal any differentiation. The shortest examples might be taken for bacterium termo, since in them the length is not more than once and a half or twice the thickness; but the larger examples are four, five, and more times longer than they are broad. That we have to deal with one species only is proved by there being present all intermediate forms between long and short rods, and chiefly by the fact that new cultures made from them invariably yield in the first twenty-four or forty-eight hours the same kind of rods, *i.e.*, motile, and all of the same length.

Measurements which I have made on several preparations showed the following :—

In a fresh specimen made of a III. culture on the third day of incubation, started with the spleen of a mouse dead of the disease, the rods varied in length between 0·0036 and 0·0054 mm., their thickness being about a third to a fifth of this.

In a specimen made of a similar culture, after forty-eight hours' incubation, but dried and stained, the rods measured in length between 0·002 and 0·0026 mm.

The rods in a section of the hardened liver of the same mouse were 002 mm. in length, or a little more.

Solid nourishing material, such as hydrocele fluid solidified by evaporation, when inoculated on the surface, yields the same rods; after two or three days' incubation, a whitish film appears on the surface of the material, which during the next days increases in thickness and breadth. This film is

composed of the same rods as above, some motile, others not; many of them appear granular after several days' incubation.

I will readily admit that the rods seen in the diseased organs of the pig, mice, and rabbits, as well as those of the artificial cultures of the first day or two, may be regarded as bacterium termo, but against this I have to mention that there are amongst them rods, which by their length most certainly correspond to bacilli; this is well seen in preparations made of the fresh spleen and liver after the Weigert-Koch method, and also in those of the artificial cultures after the second day's incubation; besides, the presence of spores in the longer rods decidedly shows that they are bacilli, and not bacterium termo.

4. Two pigs have been hitherto inoculated with artificial cultures—one with a second culture derived from the swollen bronchial gland of a pig dead of the plague, a second pig with a third culture derived from spleen of a mouse dead of the disease.

In both cases, after an incubation of two days, the inguinal glands near the seat of incubation became swollen, and this swelling increased in the next days to a considerable degree.

The temperature rose first by one, then by another degree-Celsius, fell then to its normal height, but on the seventh day rose again a degree, and kept so for a day or two. During the first rise of the temperature the animal fell slightly off in its feeding, but when the temperature fell it fed again all right. In the third and fourth week the animal seemed right, except for the swollen inguinal glands. But from my former investigations (*Reports of the Med. Off. of the Loc. Gov. Board*, 1877-1878, p. 218), I know that if such an animal is killed the lungs and intestines are found diseased to a degree that one would not have imagined from the look of the animal while living.

Inoculations into the subcutaneous tissue of mice and rabbits: with the fresh particles of diseased lung and bronchial glands of the pig; with cultures made of the bronchial gland of the pig; with spleen and liver of mice and rabbits dead of the disease; with cultures started from blood and spleen of mouse and rabbit and carried on artificially in the test-tube through several generations, invariably produced a typical disease ending in death. In pigeons, however, I have not in a single instance seen any local or general effect.

Mice inoculated subcutaneously with an infinitesimal dose of the natural or artificially cultivated virus show, after about twenty-four hours' incubation, redness and swelling at the seat of inoculation. But they remain in apparently perfect health, as regards movement and feeding, for the two or three days following the inoculation. On the fifth or sixth day they become quiet, their eyes appear partly closed, they do not feed well. Some hours later they are dying, their power of movement is greatly impaired, their backs curved, their hairs are erect, the eyes almost closed, their body feels cold, and their respiration is superficial and slow. Death occurs between the fifth and seventh, rarely on the eight or ninth day.

On *post-mortem* examination the following appearances are noticed: the seat of inoculation is discoloured, no œdema; inflammation of the small intestine (jejunum and duodenum); occasionally peritoneal exudation; spleen several times enlarged, dark, firm; kidneys dark, enlarged; liver enlarged, uniformly permeated by minute whitish points, which in some parts, notably near the inferior margin of the organ, are confluent into whitish masses. In a well pronounced case these masses are numerous and anastomose with one another. The lungs show hæmorrhage, and in most instances smaller or larger parts of the lobes are intensely inflamed, being in a state of red hepatisation.

Rabbits inoculated with virus (natural or artificially cultivated) show a rise

of temperature on the second day ; this rise amounts to one degree of Celsus. On the third day the temperature rises another degree. On the fourth day the temperature rises again by one-half to one degree, and it keeps high till about twenty-four hours preceding death, when it gradually sinks below the initial normal temperature, and then death is imminent. The animal becomes slow and quiet, its eyes become partially closed, and death soon follows. Death occurs in most cases between the fifth and seventh or eighth day.

On *post-mortem* examination the seat of inoculation is occasionally red, and occasionally there is slight hæmorrhage, no œdema ; peritonitis with copious exudation is not uncommon ; hæmorrhages under the serous covering of the large and small intestine are often seen, in some instances the first part of the duodenum shows copious hæmorrhage in all coats ; the spleen is constantly several times enlarged, dark and firm ; the liver is enlarged and shows exactly the same pathological appearances as in the mouse. The kidneys are enlarged, dark, occasionally there are hæmorrhages under the outer capsule. The lungs are generally inflamed, and there are hæmorrhages in minute points under the pleura ; in many cases large sections of lobes are in a state of red hepatisation ; there is generally pericarditis, occasionally there are hæmorrhages under the visceral layer of the pericardium.

These *post-mortem* appearances in mice and rabbits have been described already in my Memoir in 1877, but then I had not so large a number of successful cases as I now have.

I know of no acute infectious disease, except Anthrax, in which the pathological appearances as regards spleen, liver, and lung occur with such constancy as in mice and rabbits inoculated with natural or artificially cultivated virus of Swine Plague. It is hardly necessary to say that this disease is in no way related to Koch's Septicæmia in rabbits and mice. The course of the disease, the pathological appearances, and the organisms, are totally different in the two diseases.

Inoculations of test-tubes containing sterilized nourishing material made in the manner above described from the spleen of a mouse or rabbit dead of the disease—blood is also good, but not quite so reliable—has invariably yielded a copious growth of the typical motile rods, and these have been cultivated through several generations. Each culture when used during the first week of incubation for subcutaneous inoculation invariably produced death in mice and rabbits between the fifth and seventh or eighth day, with the typical *post-mortem* appearances.

With reference to M. Pasteur's statement that, passing the virus of the pig successively through several rabbits, its activity becomes attenuated as regards the pig, I have as yet had no experience, but I hope soon to be able to test it. However, I should like to point out that pigs inoculated with artificially cultivated virus (derived from the pig, or mouse, or rabbit), although becoming ill, do not die ; this I have pointed out in my former Memoir, and also that a good many pigs inoculated with dried virus derived directly from the pig do not die. And it is quite possible, as in Pasteur's cases, that the virus of the rabbit (and also of the mouse) fatal to these animals is not fatal to pigs. But whether pigs after recovery from this illness are not capable of contracting a second fatal attack, as Pasteur maintains to be the case, must be proved by direct experiment.

M. Pasteur, however, has first to show, which undoubtedly he has not shown as far as I can make it out, that his rabbits did die from Swine Fever and not from Septicæmia ; further he has to show, which he has not shown that his pigs inoculated with the virus derived from the rabbit had a mild form of Swine Fever ; and lastly, he has to show that such pigs, when re-inoculated with virus derived from the pig, do not show any alteration, that is, neither swelling of lymph-glands near the seat of inoculation,

nor rise of temperature; that they do not die, does not prove anything, since many pigs not previously "vaccinated" do not necessarily die of the disease.

I hope soon to be able to ascertain whether or not healthy pigs, when inoculated with virus that has passed through the mouse or rabbit, behave differently from those inoculated with virulent material directly derived from the pig dead of Swine Fever, but *a priori* there is no impossibility in such a difference existing; that is to say, it is quite possible that the virus becomes hereby weakened, as regards pigs, but not as regards mice and rabbits. We know now, that while sheep die of virulent Anthrax when inoculated with ordinary cultures of bacillus anthracis or its spores, or with bacillus anthracis derived from sheep or cattle dead of the disease, they do not die, but only suffer a passing illness, when inoculated with this virus after having passed through a white mouse, this last animal dying from it (Klein and Roy). And also we know from the experiments of Dr. Burdon-Sanderson and Mr. Duguid, that cattle inoculated with Anthrax bacilli first passed through the guinea-pig do not die, but only suffer a non-fatal form of the malady; and, lastly, from the experiments of Dr. Roy we know that Anthrax virus having passed through the South American biscachas does not kill cattle, these becoming ill of a non-fatal malady. All such animals, *i.e.*, sheep inoculated with Anthrax blood of white mouse, cattle inoculated with Anthrax blood of the guinea-pig, and cattle inoculated with Anthrax blood of biscachas, are for a time at least unsusceptible to a fatal attack of the malady.

Addendum.

I have recently satisfied myself that the artificial cultivation of the virus in the organs (spleen, liver, lung) of mice or rabbits inoculated from diseased swine, will produce a mild form of Swine Plague. The temperature rises 1° or 2° (Cent.) from the second day after inoculation, and continues so to about the eighth or tenth day, during which time the appetite is diminished; after which the animal quickly recovers. So that by inoculating pigs with the artificial virus obtained from mice and rabbits, they can be protected from the disease.

EVERY-DAY MATTERS IN AN INDIAN MILITARY VETERINARY PRACTICE.

BY J. H. STEEL, M.R.C.V.S., A.V.D., IN VETERINARY CHARGE, R.A., H.S.F., SECUNDERABAD (1882-3).

(*Continued from page* 431, *vol. xviii.*)

Pleuro-pneumonia, possibly Rinderpest, and certainly Tuberculosis, are very rare in the neighbourhood of Secunderabad. The latter disease does occasionally occur, but not nearly so often as is imagined, calcified hydatids detected in the lungs, *post-mortem*, being considered and described as tubercles. This is a fact of interest, and is probably in direct relation to non-prevalence of "inter-breeding," to the absence of cattle of very fine milking qualities and highly bred, all of which conditions we must deem predisposing to invasion by the bacillus of tubercle. With regard to ACTINOMYCOSIS, now proved by recent observation to be the pathological state manifested in the form of "Cancer or Tubercle of the tongue," "Clyers," and other affections familiar in England, I have records in my note-books of several cases of *peculiar fibroid tumours of the skin* of Amrut Mahal cattle. They vary considerably in size, and are most frequent in the dewlap. Sometimes they

extend root-like prolongations from the central main tumour. Occasionally they suppurate and discharge a very little pus. They are obstinate under treatment. I have excised them and the operation has not been followed by recurrence ; I am not sure whether or no they are Actinomycosis. They are considered by the natives a form of Scrofula ; Gilchrist gives an interesting account of them, but describes them as essentially *glandular*, whereas I have found them *cuticular*. They may be allied to the Lincolnshire disease known as Clyers. I had to do with one case of enormous ulcer of the skin of the shoulder, which, from its obstinate character and persistent superfluity of growth, I ultimately decided to be Cancer. I was to an extent confirmed in this diagnosis by the fact that the animal was suffering from an abnormal growth on the nictitating organ—a sort of EPITHELIOMA OF THE CONJUNCTIVA —first appearing on the conjunctival membrane of the haw, subsequently invading that of the front of the eyeball. I lay stress on this affection, because I have reason to consider it very frequent in the Amrut cattle, in which it is probably the result of hereditary transmission ; often these tumours can be dragged off by grasping firmly between the finger and thumb, but they recur after such rough removal. The enormous strength of the retractor oculi, and the thickness of the eyelids, render them almost unremovable by ordinary surgical methods. Altogether, I have found them most unsatisfactory to treat.

ICTERUS OR JAUNDICE is a condition very frequently seen among the cattle in this country, especially those imported from England, Australia, or even Aden. Within a few days of one another, a short time ago, I had two cases of Acute Jaundice, following a longish period of obscure disorder. In both, on autopsy, I found enormous distension of the biliary passages, with thickening of their walls, and occlusion of the opening of the bile-duct into the bowels. The bile in the passages contained much brick-red grumous matter, and in one case the cholocyst contained a very large calculus of concentric laminæ, softest on the surface. I have not observed flukes in the liver of cattle in this country—indeed, I think *Fascioliasis* is rare even among sheep out here. Certainly the healthiness of the livers of sheep in the Madras slaughter-houses, and the Commissariat Abattoir at Secunderabad, would astonish an English butcher. The most frequent abnormality of the liver, lungs, and spleen is ECHINOCOCCUS INVASION, which seldom causes appreciable disorder, but occasionally is in direct relation to an attack of disease. Although ANTHRAX is undoubtedly largely prevalent among the cattle of India, it is not very often seen in transport bullocks during time of peace. It is said to cause sad havoc at times in the Hoonsoor Depôt : Splenic Fever and Gloss-Anthrax are the forms it most generally assumes. I have had to do, on one occasion, with MALICIOUS POISONING OF CATTLE by the chucklers (shoemakers), with a view to procuring the hides for trade purposes. This is a matter of great importance to the cattle pathologist in India, and has been extensively dealt with in home and Indian veterinary literature recently.* The most important bearings of this crime are :—

(1) The necessity for exact differential diagnosis between Anthrax and poisoning of cattle by vegetable narcotics.

(2) The liability of cattle-poisoners to cause widespread destruction during the prevalence of severe Cattle Murrain.

(3) The liability of such cases to complicate disease statistics.

(4) The veterinario-legal aspects of the question.

The fresh arrival in India is at once struck by the frequency of FIRING OF BULLOCKS. The poor creatures seem scored all over with the hot iron,

* *Vide* VETERINARY JOURNAL, "Quarterly Journal of Veterinary Science in India," "Plain Hints on Cattle Diseases in India" (Mills), "Cattle Plague Commission Report" (Hallen)

fancifully and in neat patterns, no doubt, but to a degree which would excite immense wrath in the heart of a "cruelty agent." Yet this infliction, although indulged in without the slighest consideration for the animal's feelings, is not without objects : *Firstly*—The skin is thereby rendered unfit for the chucklers, and the animals will neither be poisoned nor given specific disease for the sake of the hide. *Secondly*—The natives like to adopt heroic and visible treatment, and fire for almost all diseases, "they fire sometimes in spots, or in straight lines, or curved along the spine, or on the flanks, and generally terminating trilinearly or forked. To this mode of termination of the lines they attach, though needlessly, great importance" (Gilchrist). *Thirdly*—Some of these marks have a religious significance. The Hindoos worship the cow, and the god Siva used to ride about on a bull, of which the figure may be seen in connection with many of the temples. The religion of the Hindoos has, indeed, some curious bearings on veterinary science in this country. In Bombay and other parts may be seen pindrapoles and other refuges for destitute, sick, and infirm animals, richly endowed by legacies of the pious. Here may be seen most extraordinary specimens of disease, many of the victims to which would, according to our western notions, be much better put out of their pain. But the Hindoo, however much brutality he may exercise on cattle, whether intentionally or, as generally, through pure thoughtlessness, draws a line at removal of life! The bullock man on festive occasions paints the horns of his bullock, decorates them with tassels, hangs charms round the neck, and otherwise makes him look very gorgeous.

Brahminí bulls may still be seen in the streets of some of the principal centres of Hindooism. Often they are much overfed, as they wander through the bazaar and obtain grain from the pious, both purchasers and vendors; often also they have loathsome disease of the genitals through dirt and abuse of the sexual powers. Probably the diminution in the number of these bulls, in consequence of the decline and subjugation of Hindooism, has much to do with deterioration of the races of cattle which, we are told, has taken place in India of late years. A Hindoo stock-owner would give up his most promising bull-calf to the priests, and this, highly fed by offerings, would attain a large size and "cover" the villagers' cows free of expense—begetting a large and healthy progeny. Deformed cattle (which are frequent in India, especially polymelians), are highly reverenced. *Fourthly*—It seems that cattle are sometimes fired simply for ornament. The driver often takes very much pride in his bullocks, and is very fond of them, and they of him. Nevertheless, we somewhat frequently find animals worked with very severe YOKE-GALLS, the pathology of which has an important relation to the question of cruelty. The pathological states of yoke-galls are as follows :—

(*a*) Recent surface abrasion of the skin of the neck.

(*b*) Serous accumulation underneath the skin of the neck, with existing inflammation.

(*c*) Acute abscess at the seat of yoke-pressure, with severe inflammation.

It is cruelty to work an animal suffering from any of these forms of yoke-gall.

(*d*) "Cold abscess," a sequela of *c*, in which all active inflammation has subsided, and the abscess acts physiologically as a spurious Bursa—a sort of cushion on which the yoke may rest.

(*e*) A true "spurious Bursa" between ligamentum nuchæ and the skin of the neck, absolutely painless, and an adaptation of nature to the comfortable reception of yoke-pressure.

An excess of zeal is apt to lead cruelty inspectors to interfere with animals worked under these two latter conditions, but no professional man could

assert that they are suffering from cruelty. The immediate cause of yoke-gall is overweighting the fore part of a two-wheeled cart, or roughness and improper shape of the yoke-bar. The natives rub the parts freely with indigo; but these injuries require no speciality in treatment. The amount of pus which escapes on incision is something enormous in some cases; fortunately the injury is so superficial that the pus seldom burrows so as to form sinuses, but forms a circumscribed abscess. The pus from cold abscesses, as above described, is generally cheesy in consistence. A pet cruelty of bullock drivers is *tail-twisting*—the unfortunate organs are used as guiding means, and become much distorted and deformed by fracture, exostosis, and anchylosis. Although we find fault with the drivers in respect to *abuse* of the tail, we cannot as concerns its *use*. European drivers seem to be useless for cattle. An attempt was made during the Mutiny to use the bullock batteries with their heavy guns, but failed entirely, as the bullocks were utterly unmanageable by Europeans. I have observed, during the emergencies of the march, a whole team of bullocks continue to obstinately refuse a dead pull over sand or black cotton soil until left entirely to native management, they not being willing to work so long as Europeans were near. This prejudice, and the tendency of bullocks to lie down when put to a dead pull, are the greatest objections to their use for army transport.

I have recorded one remarkable case of *aneurismal tumour at the front of the thorax* in a gun bullock, probably due to pressure on the throat by the lower bar of the peculiar yoke used in gun harness, etc. I have also notes on a case of *recurrent hæmorrhage from a superficial metacarpal vein*, which came on whenever the animal was put to work. This I treated by obliteration with pin suture, but the disorder recurred after a time, and about half a pint of blood trickled away whenever the animal was put to work. SHOEING of draught bullocks is extensively and efficiently carried out. The animal is always thrown, and its feet tied together for the operation. Considering the thinness of horn and general delicacy of the foot of the ox, it is very remarkable that injuries from shoeing are, in my experience, extremely rare. LAMENESS from the effects of work is a very frequent source of inefficiency of draught bullocks. In the old animals "*gummy legs*" and "*overshot joints*" are common, as in horses; *spavins* are frequent, as also are *sprains*, *contusions*, *and other injuries*. The slightly worked bullocks of the heavy batteries are frequently sufferers through playful combats; thus we have to do with *punctures* against the prepuce or anus, or *insertion of a horn up the rectum*, or wherever else it can meet resistance on the sleek, plump surface of the body; *broken limbs*, too, may result in this way, as in a case of fracture of radius and ulna with which I had lately to deal; or the horns may be broken as above described. The hip and shoulder are more liable to extensive injury than are the corresponding joints of the horse; the most frequent cause is falls, especially such as result from the above-described native method of casting these animals for shoeing or surgical operations. Foul in the foot is seen in India as often as at home. It will be remarked that I have not, as yet, said much about internal diseases. These are very rare at Secunderabad, if we except hepatic derangements. As in other animals in this country, the disorders are principally abdominal. I have seen *Fardel Bound*, and a waterman's bullock died of *Hoven* on the march from an over-indulgence in succulent herbage on the banks of a stream. The Government cattle are mostly fed on dry fodder (straw, millet stalks, or hay) with an allowance of gram; they do not therefore suffer very much from stomach and bowel disorders, except during the emergencies of active service. Among the cattle of the country, however, enormous numbers succumb to Diarrhœa and Dysentery, and the various forms of Indigestion, during the hot weather, and to Hoven when sud-

denly supplied with an excess of green grass during the commencement of the monsoon season.* It is apparent that animals out here can be purged by much smaller doses than those at home. Castor oil, so frequent in every part of India, is the common purge, and in 8-ʒ doses it acts as a laxative. It does not answer to overdo medicines and surgery in this country with cattle ; they seem to lack constitutional resisting power, and readily succumb to shock and disease. They, like most other animals in India, exhibit a tendency to asthenicity in disorders, and the stimulant tonic treatment is, therefore, generally to be adopted. *Loose, irregular, and broken teeth* are of somewhat frequent occurrence, if I may judge from my experience. The determination of the age of Indian cattle presents some formidable difficulties which it will require some accurate observation to surmount. The various shapes and forms of the horns, and their being so often polished and painted, prevent their rings proving a guide to us ; as regards the teeth, we have every reason to believe that if we were guided by the conclusions inculcated at home, we would err much in the direction of *over-estimating* the age of Indian animals. SKIN DISEASES are rather frequent, especially among animals recently sent from the depôt, possibly the result of mosquito and other insect torments in the jungle. *Ticks* are the form of parasite most frequently seen in domesticated cattle, from which they extend to horses and any other animals housed near them. Of INTERNAL PARASITES, after hydatids, amphistomes in the stomach and bowels are the most frequent, but do not seem to cause any serious inconvenience. At the recent camp of exercise I had the following two interesting cases (among others) under my professional care :—

(*a*) Canker of the external ear, similar to the disease as seen in dogs.

(*b*) Cystic tumours of small size, like submucous hydatids, inside the external nostrils and the lower lip ; nature obscure. Certainly not contagious.

In the above summary of observations, which, I trust, will be found worthy of perusal as original, and in a but little trodden field (that of cattle pathology in India), there will be found strong evidence of the important differences between bovine pathology in England and out here ; possibly the draught cattle of Herefordshire, for instance, or of France, Italy, and Austria, may be pathologically more like those of India than our British shorthorns, Kerrys, and so on. What will the country practitioner at home say on reading a paper on cattle disease, in which Parturient Apoplexy, Garget, choking, Hoose, and abortion are not even alluded to, while Hoven, Pleuro-pneumonia, and Fardel Bound receive only a casual notice? Yet in this paper I give my experience as facts have determined it, and I am willing to agree that the observations I have made are very different from those which my previous acquaintance with cattle pathology led me to anticipate. It is evident that differences of climate, work, management, breed, and general uses have so determined corresponding differences under disease of home and Indian cattle as to render the study of bovine pathology in India a special subdivision of the science of cattle disease. We hope that the matter herein given will supplement that already supplied in the writings of Gilchrist, McLeod, Western, Hallen, Mills, and Shortt.

THE NATIONAL VETERINARY ASSOCIATION.

WE beg to call the attention of our readers to the announcement of the meeting of this Association, which appears in our advertisement pages, and to express the hope that they will make an effort to attend in large numbers, in order to assist in discussing the important questions which will be brought forward.

* I have just had a case of *tumour obstructing the pylorus*, causing extensive disease of the rumen.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF COUNCIL, HELD MAY 27TH, 1884.

Dr. G. FLEMING, President, in the chair.

THE following members of Council were present :—Messrs. McCall, Simpson, Wragg, Perrins, Santy, Dray, Whittle, Reynolds, Greaves, General Sir F. Fitzwygram, Taylor, Blakeway, Harpley, Pritchard, Axe, Cartledge, Duguid, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the previous meeting were taken as read.

Election of President.

Mr. DRAY considered the successor of the then President should be endowed with considerable mental attainments and a cultivated taste, and he thought the gentleman whom he would propose, Professor Walley, possessed those qualities in an eminent degree. His attainments and qualifications were so well known that he (Mr. Dray) need not expatiate upon them, and he was confident that if the Council elected Professor Walley they would not only confer an honour upon him, but upon themselves also in so doing.

Mr. GREAVES said he wished to propose another gentleman in lieu of Professor Walley, and he was prompted to do so for this reason. He was of opinion that the Charter of the College stated that the annual meeting could only be held in Scotland once in three years, and as the next annual meeting could not, under these circumstances, be held in that country, he thought they should postpone electing Professor Walley until the annual gathering could take place there, for then it would be an additional compliment both to the Professor and to the land with which he had the honour of being associated. The gentleman whom he (Mr. Greaves) wished to propose was Mr. Peter Taylor, of Manchester. For a number of years the honourable position of President had been occupied by metropolitan veterinary surgeons, and the provincials now thought it was their turn. His opinion was that the presidential chair should be occupied by a metropolitan and provincial veterinary surgeon alternately. The provincials now numbered some 2,000 as against 200 in the metropolis, and therefore he thought the former had claims upon the office of President which ought to be recognised. Mr. Peter Taylor had been elected two or three times to the Council, and was a most regular attendant at the meetings. He was also at the present time President of an old and influential Veterinary Medical Association, and if he were elected to the chair he thought the action of the Council would be universally approved.

The ballot was then taken, with the result that 13 votes were recorded for Professor Walley, 4 being given in favour of Mr. Peter Taylor. Professor Walley was thereupon declared to be duly elected President.

Election of Vice-Presidents.

The following gentlemen—Messrs. Woods, Lawson, Lambert, Barford, Wilson, Hills, Borthwick, Simonds, Walters, and Dun—were severally proposed by Messrs. Whittle, Cartledge, Simcocks, Simpson, Santy, Axe, McCall, Blakeway, Wragg, and General Sir F. Fitzwygram.

The PRESIDENT having announced that only six of the gentlemen proposed as Vice-Presidents could be elected,

Mr. SIMCOCKS said that before the ballot was taken he wished to move that on the present occasion and in future each nominee should be balloted for separately, so that each gentleman elected should be placed in office by an absolute majority of those present. Hitherto one ballot had decided who should be the Vice-Presidents, and that arrangement precluded an absolute majority of those present being given to each of those elected. At present, if four or five gentlemen combined, and voted only for one or two, they would be able to elect them, notwithstanding that there was not a majority of those present in their favour, and his object was to prevent such a possibility.

General Sir F. FITZWYGRAM questioned very much whether "majority" meant the greater half of those present; it meant the majority of those voting.

By the desire of Mr. GREAVES,

The SECRETARY read the clause of the Charter of 1844 dealing with the election of officers as follows:—"The persons to be appointed President, Vice-Presidents, and Secretary shall be decided by ballot."

Mr. SIMCOCKS said he would withdraw his motion, as it did not seem likely to be accepted by the Council.

This was accordingly done.

The ballot for Vice-Presidents was then taken, with the result that the following six gentlemen were elected:—T. D. Lambert, 14 votes; W. Woods, 11; H. J. Cartwright, 10; J. D. Barford, 9; W. B. Walters, 9; and J. Borthwick, 7.

Election of Treasurer.

On the motion of Professor PRITCHARD, seconded by Professor AXE, Mr. Dray was unanimously re-elected Treasurer.

Mr. DRAY, in acknowledging his reappointment, said he was extremely obliged for the compliment that had been paid him. At the same time he would like to say that he thought the duties of Treasurer should not be merely nominal, but that part of his functions should be to make suggestions to the Council if the necessity arose, and that he should not be deterred from protesting, if he thought the financial position of the College was not satisfactory.

Election of Secretary

Mr. DRAY having had so many opportunities of witnessing the manner in which the Secretary performed his duties, he had not the slightest hesitation in proposing that he be re-elected.

Mr. SIMPSON said that he too was acquainted with the excellent manner in which their Secretary got through his work, and therefore had much pleasure in seconding the motion.

Mr. WHITTLE supported the motion, which was then put and carried unanimously.

The SECRETARY expressed his thanks to the Council for his re-election. He said he had always endeavoured to do his utmost towards furthering the interests of the profession, and would continue to do so. He would also like to thank the President, the Treasurer, and those gentlemen forming the Committees for the assistance they had given him during the year in all matters that he had had to place under their notice.

THE QUARTERLY COUNCIL MEETING.

The following notice of motion by Mr. T. H. SIMCOCKS was on the paper for consideration:—"That the Quarterly Council Meeting for July be held in

Manchester on the same day within the week in which the annual meeting of the National Veterinary Association takes places."

Mr. DRAY said, if he were in order, he would like to give notice of a matter relating to the Secretary, to be considered at another meeting. Since Mr. Hill had been appointed, his duties had doubled, and he had been obliged to get additional assistance, with the consent of the Council. For that additional aid the College had had to pay between £38 and £40, and what he (Mr. Dray) proposed was that Mr. Hill's salary should be raised £50, and that it should be left to his discretion as to when he should obtain the necessary assistance. He should also like to know whether the Committees could not be appointed by a special meeting called before the next quarterly meeting, at which it was usual to appoint Committees. As an illustration of the convenience which would arise from the course he had suggested being pursued, the Finance and Registration Committees would be able to meet and make good progress with the business outstanding.

The PRESIDENT said that as the present meeting was called solely for the purpose of electing officers, he thought it would be desirable that the consideration of Mr. Simcocks' motion and the important matters on which Mr. Dray had spoken should be postponed till the next meeting of the Council.

This proposal meeting the views of the Council, it was adopted, Mr. Simcocks consenting to withdraw his motion.

Mr. DRAY said that before they separated he wished to propose a hearty vote of thanks to their late President for the very diligent and attentive manner in which he had performed his duties. He thought no one had tried to elevate the profession more than Dr. Fleming.

Mr. GREAVES said it was with very great pleasure that he seconded the motion. It had been his lot to sit at the Council for over twenty years, but he did not recollect any President who had been more energetic and more active in his endeavour to serve the profession than Dr. Fleming.

The motion was carried by acclamation.

The CHAIRMAN in acknowledging the compliment said that he received the thanks of the Council with a large amount of satisfaction. He did not know that he had ever passed four years of his life with such feelings of pleasure and pride as he had done during the period he had been President. He hoped much useful work had been done, and he thought that the profession was no worse that day than on the day when he had the honour of being made President. He trusted that the chair would always be filled by men who were heart and soul in the progress of their profession, and that its duties would be fulfilled with energy, enthusiasm, and wisdom. It was a very high honour indeed to any man to become President of the College. He had himself felt the responsibility of the position, and had been aware that no effort on his part, however great, could at all equal the demands made upon him. Much remained to be done in order to place the profession on a proper footing in this country, but he was convinced that if the profession only supported those who had been labouring hard to improve its status, success was certain—nothing could keep them back in their striving for their own elevation. He thanked them very kindly for the support they had given him, for their forbearance, and for the able assistance they had rendered him on every occasion. In conclusion, he could only hope that their future Presidents would have the welfare of the profession as much at heart as he had, and that they would be able to accomplish more good than he had been able to achieve.

The proceedings then terminated.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the County Hotel, Newcastle-on-Tyne, on Friday, May 30th, the President, D. M'Gregor, Esq., Bedlington, in the chair.

There were present:—Messrs. Peele, Durham; Mulvey, Bishop Auckland; Dudgeon, Sunderland; Wm. Hunter, Stephenson, Elphick, Mitchell, A. Hunter, and the Secretary, Newcastle-on-Tyne.

Letters of apology for non-attendance were received from several gentlemen.

The minutes of the previous meeting having been read and confirmed,

Mr. MULVEY opened the discussion on Professor Walley's paper on Hernia (adjourned from the previous meeting), which was carried on in an animated manner by the members present, the President remarking that in a case of Scrotal Hernia in the horse he does not operate by means of the covered operation, but finds by making a very small incision in the scrotum, just large enough to force the testicle through, and then removing the testicle in the ordinary manner, that no ill result follows, and that in no case has he met with protrusion of the intestine as a sequel to castration performed in this manner.

Mr. PEELE condemned the use of the trocar or exploring needle in diagnosing a case of Hernia, and was of opinion that the use of these instruments was likely to be followed by Peritonitis, and stated that by the persistent use of a truss he had been most successful in reducing cases of Umbilical Hernia. He also mentioned that castration by means of the covered operation was not a favourite operation of his, as in many cases he had seen it followed by Tetanus.

Mr. MULVEY exhibited, as a morbid specimen, the scrotum of a calf, which was so large that during the animal's life it touched the ground. A *post-mortem* examination showed that it contained but one testicle, which was properly formed, but enlarged to an enormous extent.

Mr. MULVEY also narrated a very interesting case of Traumatic Carditis caused by a large piece of wire. Many of the members present had met with similar cases, which were stated to be very common in the district, in consequence of the extensive use of wire rope as fencing.

The PRESIDENT said these cases were easily diagnosed, as in every case he met with auscultation revealed a strong pumping sound in the heart.

Mr. MITCHELL said he had found all these cases accompanied by a dropsical condition of the dewlap and throat, and a dicrotic pulse.

Mr. ELPHICK said cases of this kind were of frequent occurrence in his practice, and he also gave particulars of the case of a mare which had for some time been in bad health and not thriving. This animal died suddenly, and on *post-mortem* examination a large needle was found in the liver. The needle had evidently been there some considerable time, and was encased in fibrous tissue.

Mr. W. HUNTER proposed a vote of thanks to the President, which was carried unanimously, and the meeting terminated.

WILLIAM W. SMART,
Hon. Secretary.

IRISH CENTRAL VETERINARY MEDICAL SOCIETY.

THE adjourned meeting of this Society was held at the Royal Dublin Society's rooms on the 24th April, when there was a goodly attendance of members, with some visitors. Mr. W. Pallin (late 20th Hussars), President, in the chair. The minutes of the previous meeting were read and confirmed, and several letters were read by the Secretary from members who, from various causes, were unable to attend. A letter from Veterinary Surgeon H. Sewell, A.V.D., was also read, in which he expressed a wish to resign his membership on account of his being transferred for service in England. Also from Veterinary Surgeon John Gloag, whose health unfortunately prevents him from attending the meetings. The resignations were unanimously accepted, although all present regretted the necessity. A working committee for the annual dinner, which takes place on the Monday in the horse-show week, was then elected, consisting of the President, Mr. T. D. Lambert, Mr. P. A. Lawler, and the Secretary. Some other business details followed, and the worthy President proceeded to deliver his inaugural address :—

Mr. PALLIN said : Gentlemen, It is within a few months of fifteen years since I had the honour of standing at this table to read a paper to the first meeting of the first Veterinary Medical Society formed in Ireland. That society and its meetings are a thing of the past ; and many, I am sorry to say, of the brilliant lights of our profession who sat in these benches that night have passed over to the majority—many of them good and true friends—to be replaced by new aspirants to veterinary fame. Our old friend Time has moved on, and it is no small pleasure and honour, after years of a rambling soldier's life, to find myself, after being half round the world, again at this table—this time as your chosen President for the current year—of the Irish Central Veterinary Medical Society. Small as our profession and young as our Society is, I cannot look back without pride on the progress we have made both as a profession and a society—progress not only in the scientific world, but progress in the commercial and social scale. Few professions have made greater strides during the last twenty years, and where it has not done so it can generally be traced to the apathy of the members themselves, for every day the public are learning to regard us with more importance ; and most men now have their family veterinary surgeon as well as their family doctor or lawyer. There has been no greater enemy to our social success than the want of unity amongst ourselves. The rock on which our first society split was the difficulty to get a few veterinary surgeons who practised in the same town or district to meet each other in friendly discussion, or even speak kindly of each other, and there is still the few who are ready to bicker and stand out alone ; but we have the many who are ready to come forward and cast aside this narrow-minded ignorance, and meet as scientific men, as gentlemen, and as friends. Year after year, as our Society flourishes and prospers (which I have not the least doubt it will), the circle of "outsiders" will narrow itself, and ultimately the public will learn to measure the intelligence of these men, and value them as much as we do. But to make a retrospect of the year just past is usually the duty of your newly-elected President. It has been an eventful year to our profession in the establishment of the Veterinary Surgeons' Act, and which was so long looked forward to as a cure for many professional grievances. In Ireland, however, we have not felt it so keenly as our English or Scotch brethren, where the quack horse-doctor, the horse-shoeing farrier, is more plentiful, and only too ready to dub himself with any title that caught the public the best. Men have often asked me why the species of vulgarity known in England as the "running horse-doctor" was almost unknown in Ireland. I have traced it to an innate

love of the horse, coupled with the natural inclination and power of every Irishman to detect an impostor, in horse matters particularly. In many a long march through England scarcely a village was passed through without seeing the sign of the village "vet.," who, in many instances, added it to the sign of the "White Hart," or the "Jolly Farmer." In places I have interviewed some of those worthies, and found their stock of horse-lore little better than what we find in many a stable-helper. These are the men whom *our* wise Government have taken care of in the late Act, but who, until time expires, will always be the social jar of our profession, and which now represents the noble band designated "existing practitioners." When I tell you how that out of the total number of those registered only twenty existed in Ireland, and very few more applied for the certificate, it will bear out my argument that the "quack" is not a gentleman indigenous to our little island. At the same time I have no doubt many of these persons are held in good esteem, not only by their employers, but by members of the profession, and the college has displayed a wise generosity in allowing them to continue to practise; as they are the last of their race, and as their names will not be added to, they will ultimately become a blank in the register, and the circumstance that they ever existed will in time only remain to mark a momentous turning-point in the history of our profession. Too much thanks cannot be given to those gentlemen who worked so hard for us in so important a matter to our profession, and especially to our best of friends, the President of the Royal College of Veterinary Surgeons, George Fleming. During the past year we have heard a great deal on the subject of the establishment of a veterinary college for Ireland. It has been largely discussed in the papers, has been the subject of a deputation to a Viceroy, who is a true friend of our profession, and has been keenly taken up by the noble society under whose roof we are met—to wit, the Royal Dublin Society. I may boldly assert at once, as one who has the success of our profession in Ireland deeply at heart, and far more, indeed, than many of those would-be directors and promoters of this college scheme, that I would regret the establishing of a licensing power in Ireland which would sever us in the least from the Royal College which now exists, and which, by years of great care and government, is perfect, and which cannot be claimed by England more than by Ireland or Scotland, and can send a section of its board to examine the pupils of any school which is properly constituted. The establishment of a school, well and efficiently managed, under the auspices of the Royal Dublin Society, would be a matter of pride to us all, and I look forward to its taking place at no distant day; but as men who can speak practically and independent of all professional bias, anything which would divide us from the parent tree must weaken us, and the offshoots from it would be weaker still. Some years since the subject of establishing a private veterinary school in Dublin deeply interested me, as at one time—in conjunction with and assisted by a very eminent member of the profession—I seriously thought of the venture; but when I went into the matter, and found the number of Irish students attending the English and Scotch colleges, and allowed for a probable increase of as many more—even taking into account the low fees charged by the colleges—it would not repay the outlay of trouble or capital; while we could not count on students coming from the other side of the water, as they depend on our students going over. It could only be done properly by a large Government grant or by the Royal Dublin Society; and they have given it their fullest consideration, inasmuch as, no later than the 24th February last, a meeting was held to receive a report drawn up by a committee in conformity with a resolution of the society of November 8th, 1883, to report to the Council as to the most effectual means of founding an Irish college or school of veterinary surgery and medicine with

independent powers of examining and of conferring diplomas. The committee, after referring to the Charter of the Royal College of Veterinary Surgeons of 1884, go on to state that this charter applies to the entire United Kingdom of Great Britain and Ireland, so that the power for granting veterinary diplomas in Ireland is vested in the Royal College of Veterinary Surgeons; and if a veterinary college were established in Ireland, there would be little difficulty in arranging with the Royal College of Veterinary Surgeons for holding examinations and granting their diplomas to those who should pass the examinations satisfactorily, the same as Edinburgh or Glasgow. The report then enters into the cost of an institution, in which it is stated that the probable expenditure would be £800 per annum in excess of income, estimating the students' fees at £500. In conclusion, the report states—"Finally, however desirable it may be to secure for Ireland proper facilities for veterinary instruction, the Royal Dublin Society ought not to undertake such a task, as it cannot with propriety adopt the most effectual means for attaining the object in view." On the other hand, the society might very well aid an Irish Veterinary College in the same way as the Royal Agricultural Society of England, and the Highland and Agricultural Society of Scotland aid the English and Scottish Veterinary Colleges—*i.e.*, by grants in aid and the offering of prizes to be competed for by students. There are few matters of more importance to us than the question of veterinary education, and those who peruse our journals must have been struck with the number of different opinions ventilated on the question by eminent members of our profession on the subject. The College can make laws and the schools lay down codes, but for years I have held the necessity of the "Apprenticeship Clause," and, as stated in the annual report of the College this year, "that a very great proportion of the profession and nearly the entire Council were in favour of such powers being obtained, as the necessity for students obtaining a practical knowledge of their profession is becoming every year more urgent." This knowledge the veterinary schools cannot adequately impart, as clinical and surgical instruction with regard to the domesticated animals is almost impossible, because of the absence of facilities. My experience has been, *that most of the men whom I have met who made their mark in the profession, had passed through this ordeal, and received their early training in the sick-box of the practitioner.* On the other hand, there are men who will argue that many young men's lives have been unfavourably moulded by the associates met with during their pupilage. True, I have known instances; but most of them would have turned out badly, and been useless no matter how they were educated. The early hints in the sick-box or when often, perhaps, there is a little responsibility by coming in contact with cases alone, imprint themselves deeper on the memory than far more important cases afterwards. I can call to mind now vividly many of the cases during my pupilage, and they have often and often cropped up as most useful references when I came afterwards to study the histology or pathology under competent teachers—while little mistakes made (and such are common to us all) are marked for ever on our mind at that time, and carefully avoided afterwards. Some of the most helpless exhibitions of veterinary education I have seen in the army. Men who could not earn a sovereign a month in public practice have managed to get into the service; many of them who never saw a horse get a ball, unless in the distance in college, have been appointed to cavalry regiments, amongst men who already know a good deal about horses. The result is that before a month had passed over their brother officers found the "new vet." knew little of his profession, and all confidence was lost in him. Now, most of those I have traced to men who went to college just as a means of getting a commission, and despised to have an early training from a properly-qualified veterinary surgeon. In private life those men would soon

find their practice, if they ever got any, desert them ; but in the army they move from regiment to regiment or station to station, wishing only for the day when they may claim their pension. The day, however, I am glad to say, for men of this class to enter the service is past, for at its head we have a practical, educated gentleman, the most distinguished veterinarian of the age, who will admit none but those who are practically, theoretically, and socially fitted for the valuable and important appointments in the army. In making a sweeping statement like this, I do not mean for a moment that there are not some brilliant members of our profession who never served a day's pupilage, but I maintain they are the exception too often to the rule, and I shall always consider that a few years in a good practice with a proper preceptor are worth half a college education towards success in the battle of life afterwards. Nature, too, in her wise dispensation, helps to make a good many successful veterinary surgeons. An innate love of animal life, a quick perception, a straightforward character with moderate education, seldom fail to make a successful practitioner. And now, gentlemen, there is one point which I am deeply interested in, and it is this—that although we have sent our worthy colleague, Mr. Simcocks, to the Council of the Royal College of Veterinary Surgeons, the entire Irish vote, as I may call it, should not be placed on his shoulders ; I would like to see the number of the present Council increased, and on its roll three or four of our eminent Irish practitioners. The London men monopolise it as a kind of "Home rule," but I am sure we can nominate one or two men from our society who will not grudge, in the interests of our profession, to make a trip to London two or three times a year, and assist in the government at Red Lion Square, and especially as I hope to see our present excellent councilman promoted to one of the vice-presidents' chairs at no distant meeting of the College. And now, in conclusion, a word for our society. Like any young venture, we cannot expect it to bloom forth in a year or two into full vigour. There are, however, names enrolled amongst its members which could make any association a success if they but give a little help. We have materials *ad libitum*. We want united action. I can quite understand how difficult it is for men who are in hard-worked daily practice to sit down and write a long scientific paper for us. But I would urge on each member to note the cases of interest between each meeting, and give us a short account of them—even a few notes will give us the nucleus for a discussion, and often more benefit is to be derived from it than a long-winded scientific peroration, which took weeks to work up. Be assured the public are good judges, and are pleased to see their veterinary surgeons taking an active part in the promotion and advancement of the science which they have selected as their avocation. I am proud, indeed, of the position you have placed me in as your president, and it shall not be for want of energy that I shall hand down the trust you have placed in me untarnished. I am proud to be assisted by vice-presidents of practical merit and professional standing, while with a secretary second to none, there is little fear of our barque being safely piloted through the coming year. May it be a prosperous one to each of us, and may the roll-call at the end be free from the dark cloud which overshadowed it last year in the loss of one of our best friends, Laurence Hunter, who, had he been spared, would justly have occupied the chair in which you have so kindly placed me for the year. His memory will, however, live green in the annals of this society as one of the foremost amongst its members, from its foundation until his death. Our society is launched on the third year of its life, and its success, as I have said, depends on individual help. We want more than formal attendance. Let each bring his mite of information and share it freely with us. Our profession is rich in interest—our patients present daily-varying symptoms—our ever-changing

climate and temperature bringing about pathological changes, which are often more marked in one district than in another. Though last year we had not so many papers as I would have wished, still I count on several important ones for this year. The motto of our profession should be fully borne out by our society, and let the success of it be in our union and strength.

The address was listened to with marked attention by all present, and at its close, a cordial vote of thanks to Mr. Pallin for the sound, practical way in which he had dealt with his subjects, was proposed by Mr. W. C. JOSEPH. This was seconded by Mr. G. B. MILLER, Government Veterinary Surgeon, Dublin, who took the opportunity of making some very cogent remarks on the Council representation of the profession in Ireland, and the desirability of its being extended.

The vote was carried by acclamation, and Mr. PALLIN, in acknowledging the compliment, took occasion to refer to Mr. Miller's remarks, and strongly endorsed them; at the same time advocating the absolute necessity of at least one or two other representatives in the Council from Ireland, inasmuch as this would ensure the attendance of one member at all times at the meetings of the Council, and he strongly enjoined the society to use its efforts next year to return at least two other "members for Ireland;" and with a view of being properly prepared, that the subject should be formally discussed at the last meeting of the year 1884.

Mr. M. HEDLEY then moved that the president be asked to allow his address to appear in the VETERINARY JOURNAL. This was seconded by the SECRETARY, and passed unanimously, the president assenting. The meeting separated.

J. J. SPERRING, F.R.C.V.S.,
Hon. Sec.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the Blackfriars Hotel, Manchester, April 16th, 1884. Present:—Peter Taylor, Esq., the President, in the chair, and with him Messrs. Thos. Greaves, Geo. Morgan, Wm. Woods, Wm. Whittle, T. Hopkin, E. Faulkner, S. Locke, W. Leather, H. C. Harrison, T. B. Cockshoot, T. Briggs, C. W. Ingram, and J. B. Wolstenholme, members; also visitors, Messrs. C. Phillips, Hulme, Marriott, and French.

The minutes of the last meeting were read and confirmed. The letters regretting inability to attend were laid before the members.

The SECRETARY then brought forward the illuminated letter of condolence with Miss Taylor, prepared in accordance with the resolution of December 12th last. It was approved of, and the President and Secretary were requested to convey the same to Miss Taylor.

Mr. WHITTLE then referred to the long and valued services which Mr. Greaves had rendered this Association and the profession in the Council R.C.V.S.; and as his term of office was expiring, moved that the very best thanks of this Association be given to him. This was seconded by Mr. W. WOODS, and carried unanimously.

Mr. GREAVES replied, thanking the members for the confidence they reposed in him, and assured the Association that his best efforts were always at their command.

The PRESIDENT announced the death of Mr. Cuthbert Simpson, M.R.C.V.S., of Manchester, who, though not lately a member of this Association, was a warm supporter at its commencement. Mr. Simpson was one of the oldest veterinary surgeons in the city, a very hard worker, and a warm friend.

Mr. TAYLOR moved that an illuminated letter of condolence be sent to

Mrs. and Miss Simpson. This was seconded by Mr. GREAVES, and carried unanimously. Mr. T. Briggs was entrusted with carrying out this resolution.

Mr. GREAVES then opened the adjourned discussion upon Glanders by reading a paper. He took up the position that Glanders did not, and could not arise spontaneously, but that the morbid process was the result of the introduction of a specific poison or distinct microbe; that no more could wheat or oats spring from the ground, except from the seed of a former like plant, than Glanders or Farcy develop but from the poison of the same pre-existing disease. Mr. Greaves went on to describe the various modifications of Glanders, and the conditions tending thereto as to individual susceptibility, age, food, work, and sanitary surroundings. Mr. Greaves also cited cases, and gave very interesting details of experiments he had made by inoculating a cow with glanderous matter, which, however, had had a negative result. Mr. Greaves then pointed out the prophylactic measures to be adopted, and the best modes of disinfection.

The paper was long and very practical, and evoked the praise of the succeeding speakers.

Messrs. P. Taylor, Geo. Morgan, W. Woods, T. Hopkin, C. Phillips, T. Briggs, W. Leather, E. Faulkner, W. Whittle, S. Locke, and the Secretary joined in the discussion, and Mr. Greaves replied.

On the motion of Mr. T. BRIGGS, seconded by Mr. S. LOCKE, a vote of thanks was accorded to Mr. Greaves for his valuable paper.

JNO. B. WOLSTENHOLME, *Hon. Sec.*

THE MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 448, *vol. xviii.*)

Docking sheep, under certain circumstances, is necessary for health and economical reasons, which do not apply in the case of horses—as for the prevention of maggot; and yet this prevention cannot always be secured by docking, as maggots are often found eating into the sides of sheep which have been docked, and this operation consequently does not diminish the care necessary on the part of the shepherd during the "fly season."

The fact of many surgical operations being necessary, does not excuse those which are unnecessary, and the tendency of civilization is to diminish pain and suffering, whether in man or beast.

I am more than astonished at the argument with regard to emasculation. Does Mr. Stanley really mean that the all-wise Creator placed the human testicles outside the body only in order that they might easily be removed, for the purpose of supplying eunuchs as servants to barbarians, who are jealous of their wives? Eunuchs are no more necessary than the slaves which, till lately, were employed in America and in our own Colonies. Every form of abominable cruelty or injustice might be sanctioned and perpetrated on the ground of being "necessary to the welfare and convenience of mankind." Are eunuchs necessary to the welfare or convenience of mankind? Mr. Stanley forgets that the all-wise Creator has not placed the testicles of all creatures outside the abdominal walls, in order that they might be easily removed. In the elephant, for instance, they are situated deep in the abdominal cavity (sub-lumbar region), and are so difficult of access that castration of this animal is considered an impossible operation. And yet this is a most useful domesticated animal, whose value is sometimes much impaired (as when in "must,") because it cannot be emasculated.

I might ask if an all-wise Creator placed horse's tails where they now are,

merely in order that horse-dealers, breeders, farriers, and veterinary surgeons might lop them off conveniently?

If we are to believe in the designs of Providence, no organ is bestowed unless for some useful purpose, and the horse's tail is given to complete and enhance the beauty of a beautiful animal, as well as for protection or defence, and, in a measure, to aid in locomotion.

My views with regard to the use of tails of animals differ from those of Mr. Stanley. The tail of the crocodile is not only useful in the water, but also on the land, where it is a most powerful weapon of offence and defence. With his tail the crocodile has been known to knock over a tiger. Consider the tail of the kangaroo! what a potent instrument it is in progression, and even in defence! In certain tribes of monkeys, the tail plays the part of a fifth limb during locomotion, supporting the entire weight of the body, and preventing this from falling during the arboreal movements of these creatures; and so with many other kinds of animals.

The fact of a tail or limb diminishing in size, by no means proves that it is useless, or about to disappear, as it may be more useful in a small than in a large form. The smaller digital extremities of oxen, swine, and deer, are particularly useful in preventing them sinking deeply in mud or snow, and yet they do not interfere with their speed. If certain species of animals have not a tail, it is because for certain reasons they do not require one, or some other provision is made for the absence of this organ.

The cow's tail is not such a feeble organ as Mr. Stanley represents it to be. Those who have had much to do with cattle can testify that a switch from it is not pleasant, and if the cow's tail does not always protect it from the gad-fly, it is either because this eludes the tail or (which is most frequently the the case) it attacks parts which the tail does not reach.

Horses in India would be driven mad if deprived of their tails during the fly season, and short-docked horses in this country show the misery and annoyance they suffer when they cannot brush away the flies from their flanks or hind-quarters. That the horse's tail is not a rudimentary appendage is evident from its strength and development, for in proportion as these are increased, so is the vigour of the horse. This is a fact known to all horsemen.

To sum up, I and many others who have given the subject close attention for very many years, have come to the conclusion that the horse's tail or dock is a most useful appendage, and should not be mutilated for the mere sake of fashion, and that veterinary surgeons who dock horses for mere fashion's sake are not only pandering to a depraved taste, but are guilty of cruelty, inasmuch as they are inflicting unnecessary pain: the operation being painful under any circumstances, and extremely so when performed as some veterinary surgeons perform it. The operation is not unfrequently attended with most serious results.

Not many years ago, nicking was supposed to be as useful as docking now is, and veterinary surgeons regularly performed the operation. I have also known veterinary surgeons crop dogs' ears and tails. These were fashionable operations, and veterinary surgeons practised them for pecuniary gain.

No one more than myself maintains the necessity for performing operations upon animals which relieve these from pain, or make them more useful to man; and I have come to the conclusion that docking is a useless and cruel operation when performed for fashion's sake, from an experience of more than thirty years among horses in various parts of the world, and from observation of docked and non-docked animals. Not an argument yet advanced in favour of docking, as it is now promiscuously practised on all kinds of horses, which have neither diseased nor deformed tails, can stand against those arguments which are opposed to docking.

I may add that, acting on my belief, I have consistently and persistently refused to dock horses, when the tails were not diseased or deformed, and I have never owned a docked horse, though I have ridden and driven horses all my life."

Mr. GREAVES, after the reading of Mr. Fleming's paper, continued the discussion. He said he had been at Liverpool and Yorkshire, where this question was discussed; where the question of cruelty arose appeared to be in searing, but if they omitted that in operating no cruelty arose. Many of them knew that Professor Pritchard and Mr. Fleming went down to Carmarthen and gave evidence against a veterinary surgeon for the torture he had inflicted upon a horse. It was because there were mal-practices on many occasions that Professor Pritchard took the course he had done. In the case of the Carmarthen surgeon, it was proved that he had acted in a most barbarous manner, the horse being burnt nearly to the bone to stop the bleeding. Any man, whether he be a veterinary surgeon or not, guilty of such a practice without feeling or sense, is deserving of some punishment; although he (Mr. Greaves) had said that he would not go into the witness-box against a veterinary surgeon for docking horses; he could show cases such as that which occurred at Carmarthen that deserved punishment. There was another question to be brought forward, and that was in reference to persons who, though not being registered practitioners, still treated horses. There was the common blacksmith; was he entitled to the same consideration? (No.) If the operation could be performed by the blacksmith quite as effectually as by the professional man, would you object? (A member: In nine cases out of ten the common blacksmith has not proper instruments.)

Mr. COX said that Mr. Greaves had characterised the subject as being of vast importance. They had Dr. Fleming, Professor Pritchard, and in addition the Royal Society for the Prevention of Cruelty to Animals. They had on the other side, Professor Williams and the greater bulk of the profession. There were thousands of horses docked for no reasonable purpose whatever. There was no doubt that the wholesale cruelties which now went on throughout the country, and especially in Yorkshire, should be put a stop to. Even if docking should be under the cognizance of a properly qualified man, there was no great anatomical skill required in taking off the end of a horse's tail, so long as they knew where the joint was. A blacksmith or a registered practitioner was really qualified to execute the operation. Dr. Fleming had pointed out that in the service the horses were not docked, and they did not find that they worked any the worse. To his mind, the question was one of taste. So long as the public believed in docking, it would not be discontinued; but when they got the public to believe in a graceful flowing tail, docking would disappear. Docking might be absolutely necessary in the case of harness-horses, but to cut the tail off too close was simply absurd. If the carriage could not be made to fit the horse, then they ought to do away with their carriage-builders. He did not believe that horses were not sensitive. He had seen horses in most dreadful pain, though they had been attended to in the most scientific manner. And there were instances where permanent lameness was caused by docking. Although in some instances it might be necessary to adopt this operation, yet the wholesale and indiscriminate manner in which blacksmiths and dealers, especially in Yorkshire, carried on the operation in the most barbarous manner, was to be condemned.

Mr. MEEK said as far as army horses were concerned, the question of cruelty did not come in, because he would remind the meeting that the veterinary surgeons in the army were paid by salary instead of fees; and if that was not the case, perhaps there would be more horses docked. He had seen and read Mr. Fleming's paper, but there was nothing in it that led him to believe that docking was an act of cruelty; he could not help thinking that

the veterinary surgeons of the country had been subjected to a good deal of persecution. Why did not those persons who were so anxious with regard to the question of cruelty to animals, swoop down on the talented professors? He thought that some discretion should be used by the stars of the profession before they swooped upon little men.

Mr. OLVER said that he did not agree with the indiscriminate docking of horses; that should be left to a great extent with professional men. According to Dr. Fleming's paper, he says that with regard to driving-horses, it is unnecessary to have them docked. Whether the tail of a horse was inordinately sensitive or not was a matter of dispute. In docking, he would use simply a "plug," but at the same time he agreed that "searing" should not be carried out. As to the Royal Society for the Prevention of Cruelty to Animals he supposed they would want to know what their affections were for dumb animals. He would give them an instance. He was asked the other week to take off the claws of a dog. This he did, but he put the dog under chloroform the while. There was the question of docking lambs' tails, which came to precisely the same thing. Then there were other cases of a similar nature to docking, and which the Royal Society might object to. It might be asked, Were they justified in drawing teeth? which certainly must cause some pain. Then Dr. Fleming said that in the army they would not have docked horses, and then he goes on to speak of long tails as a purpose of brushing off flies. If so, why have their tails cut at all? He agreed that in the majority of cases where the horses were turned into the field from the stable, docking was not necessary; but in the case of carriage-horses, a long tail would not at all be a desirable thing. He thought that some resolution should be submitted from that meeting. With reference to the question of docking, in general he denied that the profession made any profit—in fact, he thought they were not a penny the better for it.

Captain RUSSELL said he looked upon the subject of great importance, not only to the profession but the public generally. They had heard a paper from Mr. Stanley, but he would remind the meeting that the profession advocated docking only when necessary. He thought the question as to the operation of docking should be left to the veterinary surgeon. They certainly did not want the interference of the Society for the Prevention of Cruelty to Animals. They would next have the Society trying to get rid of spaying in the case of pigs. It was far more cruel than to cut off the end of a horse's tail. They were told that horses were not docked in the army. Why? Because in time of peace it was known that the army was not in want of many horses, and another reason was, that the officers of the regiment liked the tails of the horses to be of one uniform length; but if a war broke out it must be remembered that they would be just as glad to buy docked horses. It was said that the harness-horses ought not to be docked; but they were all acquainted with the uncomfortable situation which was experienced in driving horses that were not docked. He moved that the members of this association are of opinion that the docking of horses is a necessary and useful operation, when properly and scientifically performed. He thought it was essentially necessary that the profession should resist the encroachment of unqualified persons, such as blacksmiths, performing the operation of "docking," and that a bye-law to that effect should be drawn up. The docking of horses was only cruel when it was wantonly and needlessly performed.

Mr. COX, as an amendment, proposed that "The wholesale docking of horses now going on be discontinued, and should be applicable only when absolutely necessary."

Resolutions carried unanimously.

Proposed by Captain RUSSELL, seconded by Mr. BARLING, "That the

members of this Association are of opinion that docking of horses is a necessary and useful operation, to be properly and scientifically performed."

Proposed by Mr. OLVER, seconded by Mr. GREEN, "That the members of this Association are of opinion that docking is not cruelty in the ordinary acceptation of that word, when properly performed."

Proposed by Mr. WIGGINS, seconded by Mr. MEEK, "That the members of this Association protest against the measures taken by the Royal Society for the Prevention of Cruelty to Animals, of prosecuting veterinary surgeons, as a means of preventing docking of horses, when properly performed."

Proposed by Mr. TRIGGER, seconded by Mr. CARTWRIGHT, "That the views and resolutions of this Association be forwarded to the Secretary, R.C.V.S., with the request that it be laid before the President and Council at their next meeting."

Proposed by Mr. W. CARLESS, seconded by Mr. HILLS, "That Mr. Simpson's motion on docking horses be brought before the Council of the R.C.V.S., and has the approval of this Association and its sympathy and support."

Proposed by Mr. COX, seconded by Captain RUSSELL, "That in the opinion of this meeting it is desirable that the indiscriminate docking of horses which now goes on, should be curtailed, and be applicable only when necessary."

Mr. BLAKEWAY proposed a vote of thanks to Mr. Cox for the able paper which he had read at the last meeting.

Mr. WIGGINS seconded the motion, which was carried with enthusiasm.

Mr. MEEK proposed a vote of thanks to Mr. Stanley for his able paper.

Mr. SMITH seconded the proposition, which was carried with enthusiasm.

A vote of thanks was accorded to the President for his services in the chair; carried unanimously.

Mr. COX and Messrs. STANLEY returned thanks for the compliments.

Gloucester was fixed upon as the next place of meeting.

The members then adjourned to dinner, when a very pleasant evening was spent.

ROYAL AGRICULTURAL SOCIETY.

AT the monthly Council meeting, held on June 4th, General Viscount Bridport reported that the Committee, having carefully considered a scheme sent by Mr. Algernon Turnor for the purchase for breeding purposes of mares which have been used in the army, they were of opinion that his suggestion was beyond the scope of the Society's functions. They, therefore, recommended that Mr. Turnor's paper be returned to him, with a suggestion that he should submit his scheme to the Secretary of State for War. The Committee had received a suggestion from Mr. Dowdeswell for a grant to enable him to undertake investigations into Black Quarter and allied diseases, but they were not at present prepared to recommend a grant for the purpose. A proposal having been received from Professor Brown that the Royal Agricultural Society should appoint a district veterinary surgeon in each county, or where a county is divided, as in Yorkshire and Lincolnshire, in each part thereof, with a view of carrying into effect the scheme suggested in his paper on the Domestic Veterinary Treatment of the Animals of the Farm, the Committee recommended that this extension of the present scheme of appointing district veterinary surgeons be adopted, and that Professor Brown be asked to draw up a list of names for consideration. Half-yearly reports from provincial veterinary surgeons had been received by the Committee. The Committee had had under their consideration a proposal by a firm of veterinary medicine vendors to issue a Medicine Chest as recommended by Professor Brown in his recent paper in the *Journal;* and they recommended that the Council should require that firm, both on behalf of the Society as well as on Professor Brown's behalf, not to refer in any way, or through any medium,

whether by advertisement or otherwise, to the Society's *Journal*, or to Professor Brown; also that the Society should decline to furnish them with copies of Professor Brown's paper on any terms. The public should be informed that no cattle medicine manufacturers had been authorised by the Society, or by Professor Brown, to sell a Medicine Chest containing the remedies named in the list at the end of his article; in fact, some of the remedies named could not be sold to the public without subjecting the buyers as well as the sellers to penalties under the Poisons Act.

This report was adopted.

Obituary.

THE death is reported of Philip Rock, M.R.C.V.S., of Chelsfield, Kent, who graduated in 1835; and John Corbett, M.R.C.V.S., of Simonburn, a graduate of 1826.

Frederick W. Going, M.R.C.V.S., First Class Army Veterinary Surgeon, died from an over-dose of opium on May 25th, in Madras.

Army Veterinary Department.

Gazette, May 27th.

THE appointment as Veterinary Surgeon on probation of Frank Joslen, gent., is post-dated to May 9th.

Gazette, June 3rd.

Veterinary Surgeon A. Baird resigns his commission.

Gazette, June 6th.

Yeomanry Cavalry, Yorkshire Hussars: G. T. Pickering, gent., to be Veterinary Surgeon.

Gazette, June 10th.

Harrie Malcolm Maxwell, gent., to be Veterinary Surgeon on probation.

Gazette, June 20th.

Veterinary Surgeon William Gladstone to be First Class Veterinary Surgeon.

The Annual Dinner of the Army Veterinary Department took place at the Holborn Restaurant on June 13th. The following officers were present:—

Dr. Fleming (Principal), Messrs. Lambert, Walters (Inspectors), Sewell, Appleton, Walker, Burt, Rostron, Oliver, Reilly, J., Dwyer, Pallin, S. L., Gillard, Elphick, Whitfield, Cox, Burton, Crawford, Sartin, Jones (First Class), Spooner, Davis, Pallin, D. C., Dibben, Griffith, Kelly, Fenton, Joslen.

Notes and News.

CROPPING HORSES' EARS.—With regard to this practice, which was at one time as fashionable as the equally absurd and cruel custom of "docking" horses' tails now is, the following is extracted from "A Treatise on the Cavalry and Saddle Horse," published in 1803, the chapter being headed "On Cropping and Foxing." It is there stated: "The only reason that can be assigned for cropping horses is to improve their appearance; and this operation is performed on those particularly that have heavy ears, or what are commonly called sow-ears. But, as many people crop their horses from caprice only, be their ears ever so handsome, it is necessary, with deference to the better judgment of others, to point out what horses the cropping of would become, as well as the form in which the ears ought to be cropped to show the neck and head to advantage, and to improve the general appearance

of the horse. If a heavy-eared horse be badly formed about the neck, cropping will not improve, but, on the contrary, disfigure him. If he has a fine, regularly curved neck, rising gradually from the withers to the crest, and terminating boldly at the ears, cropping will greatly improve him, and the closer it is performed the better ; therefore it is preferable, on the whole, to leave his ears as nature formed them. A short-backed, compact horse, of good courage, and his neck formed as above, will look exceedingly well if he be cropped, and will have a very bold and warlike appearance ; but that this effect may be produced by the operation of cropping, it must be done in a particular manner. In cropping horses, those who perform it affect to give the ears the appearance of natural ones by pointing them at the top ; and from the resemblance they bear to foxes' ears, it is called 'foxing.' But this has not the effect of giving the animal a bold, courageous look, so much as if the ears were quite rounded at top ; that is, when the ears are cut right across, and rather close, and the corners rounded off, instead of being carried to a point." Nearly every horse had his ears cropped in those days, and, with cropping, the tail was nicked and docked. An animal which had suffered this triple mutilation was said by French horsemen to be completely *Anglaisé*, or *mis a l'Anglaise*—a very questionable compliment to English horsemen.

THE INTERNATIONAL HEALTH EXHIBITION.—Dr. Fleming, Principal Veterinary Surgeon to the Army, has been selected by His Royal Highness the Prince of Wales to serve as a juror in Group I., Class VI., Chemistry and Physiology of Food and Drink, Diseases Due to Unwholesome and Improper Food, and Practical Dietetics.

CONTAGIOUS DISEASES OF ANIMALS IN LONDON.—The number of cattle in London affected with Pleuro-pneumonia slaughtered in the years 1879, 1880, 1881, and 1882 was 570, 378, 300, and 259 respectively, whilst in the year 1883 the number decreased to 132. This satisfactory result is, says the annual report of the Metropolitan Board of Works, doubtless, partly to be attributed to the isolation of fresh stock, a practice which many of the more intelligent cow-keepers now adopt, and partly to the much better condition in which the cowsheds in the metropolis are now kept.

The following are the details of the outbreaks of Foot-and-Mouth Disease in London in 1883, including the animals remaining affected on the 31st December, 1882 :—Number of premises affected, 119 ; animals on affected premises, 2,748 ; animals affected, 1,503 ; affected animals recovered, 1,414 ; affected animals slaughtered, 53 ; affected animals died, 5 ; remaining affected on December 31st, 1883, 31. The number of diseased animals found in the Metropolitan Cattle Market during the year was 693. Of the cases of disease at the Cattle Market, 114 occurred in January, 310 in February, 3 in March, 3 in April, 13 in May, 9 in August, 38 in September, 37 in October, 49 in November, and 117 in December. The whole of these animals were seized by the market inspector, and slaughtered in the market under his supervision.

Six outbreaks of Swine Fever occurred in London in 1883. The number of pigs in these places was 115, of which 28 died of the disease, 68 were found diseased, and slaughtered, and their carcases destroyed, and the remaining 19 animals continued healthy. In three cases the entire stock was destroyed. The value placed on the 68 animals slaughtered by the Board's direction, and on 9 which died before the order for slaughter could be carried out, was £143 17s., and the compensation awarded, £69 13s. 6d.

HOUSE OF COMMONS.—General Sir F. Fitzwygram, Bart., has been elected to represent South Hants in Parliament.

SUPPOSED OUTBREAK OF MALIGNANT PUSTULE IN CHILI.—According to the *South American Journal*, of May 8th, an alarming disease, called the

"Picada," is reported to be making serious ravages in Chili, attacking with virulent and fatal effects both man and beast. It appears to have first affected the cattle, and afterwards extended its contagion to human subjects. It is described by the *Chilian Times* as "a sort of malignant pustule," and is said to be exceedingly contagious. The disease is attributed to the animals drinking stagnant water, rendered tepid by the fierce rays of the summer sun.

HORSES IN THE BRITISH ARMY.—In the establishment of the Regular and Auxiliary Forces for 1884-5, we find that the total number of horses in the Household Cavalry Brigade is 1,302. The Cavalry of the Line—the twenty-eight regiments of Dragoons, Lancers, and Hussars, and the depots, Staff of Cavalry Depot and Mounted Police, are down for 15,420 troop horses. The Royal Artillery have 10,902 horses; the Departmental Corps, 1,100. The total establishment of horses is 23,210.

Correspondence.

PARTURIENT APOPLEXY IN CATTLE; COMMONLY KNOWN AS "MILK FEVER."

DEAR SIR,—In your issue for the current month, I notice Mr. Pottie delivered an address before the quarterly meeting of the West of Scotland Veterinary Medical Association on the above subject, in contradiction to the theories advocated by Mr. J. R. Cox, which have previously appeared in print. As I was present at Birmingham, and took part in the discussion his paper elicited, perhaps you will allow me space to offer the few following remarks. The actual cause of so-called Parturient Apoplexy, or Milk Fever, being at present shrouded in mystery, of course the various opinions already advanced are merely theories wanting proof, and therefore one theory may be as good as another, and certainly should be allowed fair play in criticism. Considering Mr. Pottie's great and varied experience of upwards of a quarter of a century, I am surprised he did not remember this, by exercising a little more judgment in the form of the language he chose to adopt. As I have no doubt Mr. Cox is quite capable to take care of himself, and as I have no desire to enter into a controversy with Mr. Pottie on the subject of his paper, I will content myself by stating that, if Mr. Pottie will read Mr. Cox's paper carefully through, he will find he has misquoted a remark, and thus completely changed the meaning of the whole sentence. At page 406, December number of VETERINARY JOURNAL, from "It is generally conceded" to end of paragraph; on the second line from the top the last word is "*rarely*." Mr. Pottie, at page 450, June number, line ten from the top, makes it "*always*"; so palpable a mistake, I feel sure, will be duly acknowledged. I have given Mr. Cox's *pack* a trial since reading his paper, and can certainly claim in eight cases (*all in shorthorns*) the most happy results. In my opinion five of these cases were *in extremis* when the pack was applied. That it requires watching, I admit, and that may be considered a great drawback, for in my experience I find it is next to impossible to expect an ordinary cowherd to be able to remove or replace the "pack" properly, or to know when it should be discontinued. I have found it quickly induces a profuse perspiration, so excessive that the animal literally "*reeks*," and that, I believe, is what Mr. Cox states it will do. This opinion I gave at the Midland Counties meeting at Birmingham, and my remarks were confirmed by others present.

Yours faithfully,

Grantham, June 17th. BEN. H. RUSSELL, F.R.C.V.S.

CONSTITUENCY REPRESENTATION.

SIR,—In the Annual Report of the Council, and in your pages occasionally, slight reference has been made to a "Memorial from Scotland"—from the three Scotch societies; perhaps, with your permission, a few words as to the purport of that memorial may not be out of place.

Our profession, as a body bears, somewhat the same relation to the Council as the country, as a nation, does to Parliament. The holders of the R.C.V.S. diploma are the voters, the Council chamber may be said to be our House of Commons. Parliament is the representative governing power of the country, the Council of the Royal College of Veterinary Surgeons is the representative governing body of the veterinary profession. The mode of election and representation which has so long commended itself to the common sense and good feeling of the country, and which has so greatly contributed to its advancement and prosperity, might be useful and beneficial to us as a profession.

The scheme embodied in the memorial, and presented to the Council, February, 1883, briefly stated is this :—Make the Council our Parliament, and elect its members by the constituency system. There are thirty-one members of Council; divide England, Scotland, and Ireland into thirty-one constituencies, and give each constituency the power to choose and send its representative to Council.

The following is the sketch of constituencies sent with the memorial (slightly abridged) :—

ENGLAND.

Counties.	Practitioners (M.R.C.V.S.) Register, 1882.	Representatives.
1. Northumberland, Cumberland ... Westmoreland ... Isle of Man... ...	56	1
2. Durham and 3. York	169	2
4 & 5. Lancashire ...	170	2
6. Cheshire, Shropshire & N. Wales	81	1
7. Hereford ..... Gloucester ..... Monmouth, and South Wales ...	64	1
8. Stafford..... Worcester..... Warwick	98	1
9. Nottingham ..... Derby ..... Leicester ..... Rutland	85	1
10. Lincolnshire.....	64	1
11. Northampton ... Huntingdon..... Cambridge ..... Bedford.....	49	1
12. Essex..... Hertford ..... Buckingham..... Oxford	86	1
13. Norfolk..... Suffolk	74	1
14, 15. Middlesex	190	2
16. Kent ..... Sussex	77	1
17. Surrey ..... Berkshire	76	1
18. Hampshire ..... Wiltshire ..... Isle of Wight ... Somerset	80	1
19. Dorset ..... Devon ..... Cornwall	67	1

SCOTLAND.

1. Orkney ..... Caithness ..... Ross ..... Inverness ..... Banff, Aberdeen Kincardine, Forfar	54	1
2. Perth, Fife, Kinross, Clackmannan, Stirling	53	1
3. Midlothian, Linlithgow, Haddington, Peebles, Berwick, Selkirk, Roxburgh	66	1

Counties.	Practitioners (M.R.C.V.S.) Register, 1882.	Representatives.
4. Dumbarton, Renfrew, Lanark	78	1
5. Ayrshire, Dumfries, Kircudbright, Wigton, Argyle, Bute, Island of Islay	50	1
IRELAND	146	3
Royal Veterinary College, London		1
Royal (Dick's) Vet. College, Edinburgh		1
The Glasgow Vet. College.....		1
The New Veterinary College, Edinburgh		1
	1,933	31

This sketch is, of course, only approximate, not a final arrangement. It gives, in round numbers, to the 1,500 practitioners of England 19 representatives, the 300 of Scotland 5, the 150 of Ireland 3, and each veterinary college a seat at the Council Board. Room might also, we think, be found among the constituencies for one or two representatives from the army, the 100 or so army veterinary surgeons electing among themselves their representatives. No mention is made of veterinary medical societies. Their membership varies greatly—the existence even of some of them is precarious. Each, however, might interest itself in the return of the members of its respective districts.

It may be asked, What advantages has this scheme over the present system of election ?

1. Each year the Secretary of the R.C.V.S. has had to issue from 1,500 to 2,000 voting papers. Some of these never reach their destination, others are not understood, many are neglected, and the 1,000 or 1,300 which are filled up and returned give the scrutineers at the annual general meeting sufficient work, while withdrawing them from the business of the meeting. The whole system involves an amount of work, expense, and loss of time which, we think, might be lessened.

If the Council, instead of filling up the six annual vacancies by a general vote of the profession, would simply allow six constituencies in rotation to do so, then as each constituency numbers considerably under 100 members only in an extreme case would 600 voting papers be required. Again, if the members of a constituency were unanimous as to the man of their choice there need be no voting for him. If the six constituencies were ready with their own men, the six vacancies would be filled without the issuing of a single voting-paper ; and in five years the Council would be filled by men chosen and sent by the members of the profession in all parts of the country —a saving of time and money, less work, and a better result.

2. An assured seat to the representatives of the colleges, and, it may be, of the army. The claims of each teaching school and of the army to permanent representatives—their principals, probably—on the Council will, we think, be admitted. Under the present system, however, these gentlemen have to seek election like private practitioners, and one occasionally fails to find a seat, and we have the anomaly of an unrepresented college or school. The proposed scheme does away with this irregularity.

3. All sections and classes of the profession would be equally, directly, and specially represented in Council. The result of the present system of election is, and has always been, a big majority for the south. *Twenty London and Lancashire practitioners, a few from the provinces, and two or three from Scotland and Ireland, have decided every important Council matter for the last thirty or forty years.* Has this always been for the good of the profession ? A little reflection will, we think, show that had Scotland been properly represented at first on the Council and Examining Board, the Highland Society's examinations would never have been resuscitated, the

profession would not have been divided, and the way would have been clear for a Veterinary Surgeons Act five-and-twenty years ago. Pupilage may commend itself to practitioners in the south ; how could it be put into general practical operation in many parts of Scotland? No more important duty devolves on the Council than the appointment of the Board of Examiners, yet at last election our southern friends, we are told, did not know the men of Scotland and Ireland, and passed them all over. After 1886 only Fellows can be Councilmen and examiners. The Fellows are few—many young in years and experience ; will this arrangement be beneficial? Have these decisions and acts of Council on these and other important matters fairly represented the wishes and desires of the veterinary profession at large? The Royal College of Veterinary Surgeons is our national body, and its Council, like its Examining Board, should surely be in a greater measure than it is a national one—a Council truly representing the profession throughout the three kingdoms. Constituency representation in Council as in Parliament gives this result. Men need not be summoned long distances for trivial matters. An architect's report, a dinner, a student's letter, a quack registration, and all such minor business every-day matters might safely be left to the discretion of a committee north and south of the Tweed. But in the discussion and decision of important matters, of matters deeply concerning the welfare of our body—such as provisions of the Act, the appointment of examiners, the erection or non-erection of college buildings, the pupilage and Fellowship questions, etc., every veterinary surgeon, and all classes of veterinary surgeons, are entitled to make their voice heard, and they will best do so, surely, through men chosen and sent specially by themselves.

The country would never stand a general vote or *plebiscité* by voting-papers from Westminster. The confusion of such a system would render it almost unworkable. A general election, instead of being got over in a day, would entail days, if not weeks of scrutinising, and many a popular city alderman, mine-owner, and manufacturer, wealthy landed proprietor, and such like, *by the force of numbers and locality*, would usurp the seats in the House of Commons, now filled by better men—the representatives of thickly populated and less-favoured parts of the country. The constituency system, with its "territorial arrangement," its "sentimentalism," its "mechanical ideas," its "geographical representation," is, after all, the only system which the common sense and intelligence of the country will tolerate.

But it has been said that constituency representation is foreign to the constitution of the Royal College of Veterinary Surgeons, and cannot be recognised by it. The constitution of the Royal College of Veterinary Surgeons looked on in sorrow when, in body and spirit, it was a sort of appendage to a southern teaching school, but for years was powerless to help itself. It looks on unmoved when Scotland and Ireland are in a decided minority on its Council. And if in a few years the constituency form of election and representation could be grafted into the constitution of the R.C.V.S., the Royal College of Veterinary Surgeons would surely lose nothing, but gain much in strength, fairness, good feeling, and good wishes.

But will our Scotch and Irish friends attend to their duties in Council? The prayer of the memorial is not that constituencies shall send "local representatives," nor that Scotch practitioners shall send six Scotchmen, nor Irishmen three Irish veterinary surgeons ; but that thirty-one constituencies be permitted to send thirty-one representatives, from whatever country or district they please.

There are sixty or seventy holders of the R.C.V.S. diploma in the Lothians and adjoining counties. Cannot these men be trusted to find a good man fit for the Council, and send him to it? One of our number would understand us, and, if agreeable, we would give him the preference. Failing that,

for example, we would be delighted to send the President of the North-West of England Association, or one of the speakers at the last annual general meeting, if they would favour us. On the eve of the discussion of any important matter, these gentlemen would be made acquainted with the general feeling and wishes of the members of the district. If our English friend and representative attended to those wishes, and as far as he conscientiously could, tried to advocate and advance them, we would honour and re-elect him. If he did *vice-versâ*, we would dispense with his services at next election. So with the other constituencies. This form of election would tend to make Councilmen careful as to what those at home thought of their votes.

But will all the constituencies find representatives? A vacant seat in the House of Commons is generally soon filled. There will always, as far as we can judge, be suitors for a seat on the Council. Some may not be so regular in attendance as others, but to a meeting of representatives in London, Manchester, Carlisle, or Edinburgh, thirty-one men will surely be found willing and patriotic enough to journey twice or thrice a year to deliberate and decide on matters deeply affecting the interest of the profession to which they belong.

In apologising for the length of this letter, I trust I may not be held guilty of egotism or presumption in the remarks I have made. The memorial was not presented in a captious or fault-finding spirit, but simply and solely as a means for better representation and government. If, sir, constituency representation is wrong in premises, principles, and conclusions, let it be proved so, and discarded. If it is right, and for our benefit, will it not be well to test and bring it gradually into operation? This was our prayer to the Council, to which they turned a deaf ear. The matter rests with the profession at large. I am, sir, yours very truly,

Slateford, 13*th June*, 1884. C. CUNNINGHAM.

CORRECTION.—In the last issue of the Journal, page 458, Mr. Cawdle should have been shown as having passed with "Great Credit."

THE Report of the Border Counties and Scottish Metropolitan Veterinary Medical Societies, sent too late for this month's Journal, and several communications for which space could not be found, will appear in the August number.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from E. M. Davy, London; J. J. Sperring, Dublin; J. A. Nunn, A.V.D., Lahore; F. Smith, A.V.D., Bangalore; R. W. Burke, A.V.D., Cawnpore; A. W. Hill, London; W. Osler, M.D., Montreal; T. Flintoff, A.V.D., Meerut; Professor Walley, Edinburgh; J. B. Wolstenholme, Manchester; R. H. Dyer, Limerick; G. G. Mayor, Kirkham; W Penhale, Barnstaple; C. Cunningham, Slateford; J. Donald, Wigton; B. H. Russell, Grantham; T. H. Lewis, Edinburgh.

BOOKS AND PAMPHLETS: Return (Ireland) for 1883, Contagious Diseases (Animals) Act; *A. Zundel*, Quelques Considérations Economiques sur la Fièvre Aphteuse; *F. Peuch*, Précis de Police Sanitaire; *E. Aureggio*, Recherches sur les Affections Farcino-Morveuses du Cheval et de l'Homme; Nouvelle Ferrure a Glace; *H. Bouley*, La Nature Vivante de la Contagion; *R. Wallace and E. Kinch*, The Natural and Artificial Food of Scotch Hill Sheep; *J. Csokor*, Ueber den feineren Bau der Geflügelpocke; *A. Baranski*, Die Zähmung Unserer Hausthiere.

JOURNALS, ETC.: *National Live Stock Journal; Recueil de Méd. Vétérinaire; Der Hufschmied; Revue Vétérinaire; Journal de Méd. Vétérinaire; Archives Vétérinaire; Der Thierarzt; L'Echo Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Lancet; Animal World; American Veterinary Review; Edinburgh Medical Journal; Annales de Médecine Vétérinaire; La Clinica Veterinaria; Live Stock Journal; Mark Lane Express; British Medical Journal; La Presse Vétérinaire; Repertorium der Thierheilkunde; Medical Press and Circular; Nature; Field; Quarterly Journal of Veterinary Science in India.*

NEWSPAPERS: *Westminster and Lambeth Gazette; Madras Times; County Gentleman; Morning Post; Irish Times; Sporting Gazette; Bombay Gazette; Sou Eastern Gazette.*

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

AUGUST, 1884.

LACTATION AND TETANUS IN FOALS.

BY W. H. BLUNT, M.R.C.V.S., LUTTERWORTH.

THE following rather rare cases came under my notice, in my father's practice a few weeks since, which I thought would be worth recording in the VETERINARY JOURNAL. On the 24th June I was asked to look at a foal (filly) a day old, which I did. I found it had a very large mammary gland, quite as large as its mother's, and which was distended with milk that kept continually escaping from it. After keeping the mare short of food for a few days, and giving alterative medicine, both the mammary gland and the milk gradually disappeared. The following week I was again asked to see two other foals a few days old, the property of different owners. I found them suffering from well-marked symptoms of Tetanus, all the superficial muscles being contracted, especially those of the head and neck. The jaws were firmly fixed, the nostrils dilated, the *membrana nictitans* nearly covering the eye. The first died before anything could be done to relieve it; the second lived nearly a day. Perhaps some of the many readers may be able to enlighten us as to the cause of these rather rare cases.

ACCIDENTAL DISLOCATION OF THE LEFT POSTERIOR OS CORONÆ.

BY T. FLINTOFF, A.V.D., 8TH HUSSARS, MEERUT.

LAST month a case of the above nature occurred in a troop horse of the 8th Hussars, and being a most unusual lesion I send it to the VETERINARY JOURNAL for publication.

The horse was found on the morning of the 17th of April unable to bear any weight on the limb; cause not known—the heel-rope, I thought at first; but, on investigation, I found the heel-rope had been on the other leg (off hind).

Diagnosis.—Dislocation of the os coronæ, from the articulating surface of the os pedis in a backward direction.

Every devisable means were unsuccessful in reducing the limb to its natural position. The horse was thrown and a strong rope, with four men pulling at it, was fastened round the hoof, whilst I put my knee to the back part of the pastern, using all possible force, with one hand on the foot and the other on the fetlock, but all to no purpose. Next day, other means were tried. First, by throwing the horse and placing him on his belly, with the forelegs stretched out forwards, and the hind legs backwards. This I did, so as to get the injured limb placed as nearly flat on the ground as possible, with its anterior aspect downwards. Then a very heavy man, with his boots off, was made to jump on the back of the pastern, where the prominence showed most; and afterwards, when these means failed, a strong piece of wood, well covered with leather, was placed (where the hollow of the heel ought to have been) on the most prominent part, and hit several times with a heavy hammer; but all efforts were futile.

Prognosis.—Unfavourable. During the latter operations I had a very strong pressure applied to the hoof, and the horse firmly fastened in every way, and it appeared as though no amount of force would ever reduce the dislocation.

Tautological.—The case was destroyed as incurable on the 30th of April, being of no further use to the service.

Post-mortem.—The os coronæ was found to have slipped out of the articulating cavity of the os pedis backwards and past the

lateral ligaments; these last-named structures prevented the bone being forced forward into its proper position, being firmly locked over the lateral prominences. The capsular ligament was considerably lacerated and inflamed, causing slight effusion and swelling about the region of the coronet.

Mr. R. Poyser, officiating I.V.S., 2nd Circle, and Mr. J. Anderson, officiating superintendent of breeding operations, saw the case with me, and both were of opinion that it was a hopeless one and ought to be destroyed.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 422, *vol. xviii.*)

HAVING described in my former paper the method I consider best to be adopted in the examination of horses as to soundness, I will endeavour to follow up the plan laid down, so as to elucidate the subject as fully as my abilities will dictate. It must not be supposed that I shall attempt to trace the steps of those writers who have preceded me in treating the subject, but shall strike out a path of my own, which will, it is to be hoped, render these observations acceptable to those members of the profession whose practice does not lead them into this branch of veterinary tactics to any very great extent. There are doubtless scores of veterinary surgeons who are engaged principally in a country business, and who cannot, of necessity, be expected to devote as much time to this subject as others of their professional brethren residing in cities. The course proposed to pursue in elucidating the subject will be in accordance with the system carried out in my practical examinations. It must be, however, distinctly understood that they refer particularly to *undisputed* cases.

It may, perhaps, be necessary, in order to make them more intelligible and complete, if that portion of our duties, viz., *post-mortem examinations*, are occasionally made matter of

comment, but as I am not often called upon to investigate cases of this nature, it will not be expected that I shall dwell long upon them. Happily, in this country, but few such instances fall under notice, which fact alone speaks volumes in favour of the system I have so long advocated. The head being the part in our examination to which attention is first directed, I shall proceed to consider the state of the mouth. There are several reasons why we should carefully scrutinise this cavity. In the first place, it is desirous to ascertain the age of the animal, which occasionally is somewhat difficult and puzzling to the practitioner; especially is this so to the youthful ones, as some horses have forward and others backward mouths, and this is accounted for in more than one way. An animal foaled in January will have a more forward mouth at the age of three, four, or five years than one foaled in June, July, or August. Another cause is early or late development of the teething process. This is not so observable in young horses as in children. I have seen three-year olds mark four; a four-year old mark five, and so forth; and occasionally may be noticed that one side of the mouth will indicate the difference of a year to the opposite in the same animal. Some yearling ponies will present appearances of having a full mouth of *permanent* teeth. This remark, however, has reference to the female sex only, simply from the fact that tusks are absent in this sex. Some old horses will have their teeth so evenly worn and perfect, that one of twenty-four years old may pass muster as a six-years old with inexperienced examiners.

This, and more, will be often witnessed in natural cases, so that it is necessary for examiners to make themselves acquainted with all the variations which are likely to occur. When it is known that *art*, now and then, is had recourse to, to aid dentition, it becomes still more incumbent upon us to fully understand what the art is capable of effecting. I need scarcely record the fact that those men designated *tinkers*, *copers*, or screw-dealers are ever ready to tell their customers that the horse shown is *six-off*. This assertion is generally true—he is *six-off*, certainly. Having satisfied one's self that the age is what has been represented or otherwise, the attention should next be directed to the

formation of the mouth, and observe if the incisors are evenly worn and unbroken. By this we can form an idea as to whether the animal is a crib-biter or a wind-sucker. Some horses are so uneasy to clean, and they so lay hold of hard substances with their teeth during the sanitary process, that these become worn and broken at their edges. This is more frequently found in aged horses that have been stabled for years and highly fed, and in some cases those who have been teased by bad-tempered grooms. If the teeth are uneven, it is advisable to have the animal under examination so tied or placed that he may be left alone, with a view of allowing time and opportunity of "cribbing"; but I don't consider that an examiner ought to be, *under any circumstances*, held accountable should he pass a crib-biter, because it is well known that some inveterate cribbers will remain in a strange stable for hours without attempting the habit, and more especially is this the case *when the groom is near him*. I have seen men in charge of horses persistently remain close to the horse under examination, and this act always carries suspicion with it, that there is a *screw loose somewhere*. It is advisable to examine the molars, if this can be done, as caries may exist, or displacement, or irregular growth of one or more. Mistakes have been made, and horses have been condemned as glandered when it was found that a tooth was diseased. There are several diseases of the mouth. Paralysis of the lower lip may be present, or the horse may have a *parrot* mouth, or be suffering from "Lampas." I have seen a few horses with only half a tongue. Either of these affections, in a *legal* sense, would be considered unsoundness.

Assuming that the horse is a crib-biter, what is now our duty? This is a knotty question, and requires investigation. What is a crib-biter, and does the habit constitute unsoundness? It will be interesting to read the opinions of some of the most learned writers of the present century, that we may compare their views with our own. Blaine writes thus: "This peculiar action is generally supposed to arise from a small quantity of air drawn *into* the stomach, and is hence called sucking the wind. . . . It consists in the simple eructation or forcing *out* of a small quantity of gas, let loose from morbid combinations within the stomach, which, as it proves a source of irritation, to aid its expulsion the horse applies his

teeth to a fixed point, by which he gains help of some of the muscles of the fauces to open and straighten the œsophagus, while, at the same time, by means of the abdominal muscles, he presses on the stomach, and forces *out* a little of the irritating air. . . . It is considered a vice, a habit acquired, etc. I believe it always commences in dyspepsia, the consequences of long living on dry food, etc." Again, he writes, "crib-biters seldom carry much flesh." Youatt writes thus: "It is the *inhalation* of air." Here is at once a difference of opinion between those learned men, and they were both practical ones. Their opinions were the very opposite. Youatt goes on to say: "The crib-biting horse is notoriously more subject to colic than other horses."

A case was tried before Lord Tenterden, and thus decided: "*A horse with crib-biting is unsound.*" In vol. i. of the "Veterinary Record," p. 263, the president of the Veterinary Medical Association, whom I believe to have been Professor Spooner, says, "I now proceed to notice another peculiarity which the case presents (it was of obstruction of the base of the cæcum, caused by a large carcinomatous growth), and which is worthy of even more than a passing remark. The horse was a crib-biter. I have opened (he continues to say) the bodies of hundreds of horses which during life manifested this habit, but I never met with a case that did not show some lesion in some part of the alimentary canal, and this has generally been in the stomach. My respected colleague, Mr. Sewell, is, I believe, of opinion that crib-biting always arises from ulceration of the stomach. I am rather inclined to regard it as arising from *functional* derangement of the digestive organs in the first instance, proceeding to structural disease as the habit becomes more confirmed. In this case the stomach presented an unhealthy appearance, and its parietes were irregularly developed, being more dense in some parts than in others. The œsophagus likewise was dilated in places, and where dilated much attenuated in its coats. This atrophy of the œsophagus is the cause which renders crib-biters so liable to be choked, from the food becoming lodged there. And since crib-biting is thus found to be associated with disease, and, moreover, exposes the animal addicted to it to danger, I cannot view it otherwise than unsoundness." Percivall, in vol. ii., p. 198, of

his "Hippopathology," writes as follows: "In the stable tympany is of rare occurrence, unless it be in crib-biters, who are suffered to pass their time in sucking in air." This author seems specially quiet upon the subject. Mayhew, in writing upon it, says, "In submission to general opinion, it has been alluded to as a habit learnt within the stable. The air is much more than inhaled. A large quantity is swallowed with the saliva. No slight amount is deglutated with the masticated food." In the *Veterinarian* for 1853, p. 443, we quote as follows:—"Considerations on Crib-biting, with Eructation, by M. E. Fischer. Although the abnormal action with horses known under the appellation of crib-biting is so often observed, it is still one far from being sufficiently understood. Many of our best veterinary authors have furnished dissertations on the subject, but these present a great variety of opinions touching the causes, seat, nature, and consequences of crib-biting. Whilst one contends that, in the act, the horse swallows atmospheric air, another pretends that the animal ejects air, which act is accompanied with a particular noise, created by gas generated in the stomach. Some say the habit is injurious to horses who practise it, and that it frequently renders them valueless, whilst others maintain that it nowise materially hurts them. The Court (of Appeal) has pronounced in favour of its innocuousness." The writer goes on to say what others have said before, viz., that crib-biting is not a disease of itself. He is of opinion that it should be regarded as a vicious habit rather than a disease. Oliphant, in treating of this habit, says, "Crib-biting being an unnatural sucking in of air, must be to a certain degree injurious to digestion, must dispose to colic, and so interfere with the strength and usefulness and health of the horse. Some crib-biters are good goers, but they probably would have possessed more endurance had they not acquired this habit, and it is a fact well established that as soon as a horse begins to be a crib-biter, he, in more than nine cases out of ten, begins to lose condition. He is not to the experienced eye the horse he was before. The wear of the front teeth, and even the frequent breaking of them, makes a horse old before his time, and sometimes renders it difficult, or almost impossible, for him to graze. Crib-biting which has not yet

produced disease or alteration of structure is *not* an *unsoundness*, but is a *vice* under a warranty that a horse is 'sound and free from vice.' Thus, when an action was brought on the warranty of a horse which had been sold for ninety guineas, the question was, whether crib-biting, which was the *vice* in question, was such a species of *unsoundness* as to sustain the action. The horse had been warranted sound generally. Some eminent veterinary surgeons were called as witnesses, who stated that the habit of crib-biting originated in indigestion; that a horse, by this habit, wasted the saliva which was necessary to digest the food, and that the consequence was a gradual emaciation. They said that they did *not* consider crib-biting to be an *unsoundness*, but that it might lead to *unsoundness*, that it was sometimes an indication of incipient disease, and sometimes produces *unsoundness*, where it existed in any degree. Upon this Mr. Justice Burroughs said, 'This horse was only proved to be an incipient crib-biter; I am clear that it is not included in a general warranty;' and the plaintiff was accordingly non-suited." "In a later case a horse was bought warranted 'sound and free from vice,' and an action was brought against the vendor on the ground of its being a crib-biter and *wind-sucker*. Veterinary surgeons were examined, who said that the habit of crib-biting was injurious to horses, that the air sucked into the stomach of the animal distended it, and impaired the power of digestion, occasionally to such an extent as greatly to diminish the value of the horse and render it incapable of work. Some of the witnesses gave it as their opinion that *crib-biting* was an *unsoundness;* it was not, however, shown that in the present instance the habit of crib-biting had brought on any disease, or had, as yet, interfered with the power or usefulness of the horse. Mr. Baron Parke told the jury that to constitute *unsoundness* there must either be some alteration in the structure of the animal, whereby it is rendered less able to perform its work, or else there must be some disease. Here neither of these facts had been shown. If, however, the jury thought that at the time of the warranty, the horse had contracted the habit of *crib-biting*, he thought that was a *vice*, and that the plaintiff would be entitled to a verdict on that head. The habit complained of might not, indeed, like some others (for instance,

that of kicking), show *vice* in the temper of the animal, but it was proved to be a habit decidedly injurious to its health, and tending to impair its usefulness, and came, therefore, in his lordship's opinion, within the meaning of the term *vice*, as used on such occasions as the present.

It will be advisable at this stage to analyse the various opinions which are here recorded, so that we may arrive at some definite conclusion upon this disputed question. Blaine believed it to be a *vice;* but he stated *it always commences in dyspepsia.* If it always commences in dyspepsia, it should not, I think, be called a *vice.* There seems to be some inconsistency in his reasoning. Youatt wrote in favour of its being an unsoundness. He wrote, "The crib-biting horse is notoriously more subject to colic than other horses." Spooner said, "I cannot view it otherwise than *unsoundness.*" Fischer considered the habit one of *vice* only. Mr. Justice Burroughs considered it to be a *vice;* Mr. Baron Parke was of the same opinion, viz., *vice.* This is perplexing.

It is difficult for practitioners to write certificates, with all I have written of the opinions of leaders of the profession, or to tender evidence in a court of law, without being subject to ridicule. In nearly every instance, writers have stated their belief that the "habit" commences in dyspepsia, and that it is likely to go on to produce structural derangement of parts within the alimentary canal. It may naturally be asked, When are we to make up our minds as to the actual moment structural change commences? What symptoms are to be looked for in a crib-biting horse to lead to the inference that a lesion of any portion of the alimentary apparatus has taken place? Until these questions are satisfactorily answered, and one's attention can be so directed as to diagnose those appearances or symptoms possessed by an animal addicted to the habit, it would be presumption on the part of any individual to state that this or that crib-biter is a *sound* animal, without running the risk of being censured by one party or the other. We, most of us, have known horses which have had the habit for several years, and they have fed well, worked, and looked well. This, however, is no proof that they are not diseased. Doubtless,

there are many members of the profession acquainted with hundreds of horses whose constitutions are at fault in some way or other; still they perform their work satisfactorily. This is no proof that they are not unhealthy. I knew a horse who used to journey twenty-four miles a day at a fast pace, and whose "strap" he carried upon his harness collar to and fro, so that it should be placed in position immediately on his arrival at his stable. This horse was extremely good as a poster.

No remarks have been made by me in regard to what is termed *wind-sucking*. It may reward us if we inquire if there is in *reality* such a habit as *wind-sucking?* For my own part, I never did or could believe that horses *suck wind*. The air, or gas, which is in the stomach is *generated there* precisely in the same manner, we know, in which it is formed in man. Decomposition of the food in the stomach occurs, and fermentation takes place speedily, and the formation of gas is a natural result; but the act as seen, which has given rise to the term wind-sucking, is nothing more than what the instinct of the animal prompts it to do, in order to disencumber itself of the unpleasant sensation present in the stomach at such times. I think the subject may be disposed of after relating one instance (wind-sucking). I stood behind a mare as she was quietly eating hay in her own stall, and all at once she commenced to perform the act so well known by horses afflicted with this complaint. In the course of five minutes the abdomen of the mare was so swollen that it seemed as if it would burst; it resembled the worst case of "Hoven" in cows I ever witnessed. In as many more minutes the swelling disappeared.

Now, it would have occupied a considerable time for so much air to have been sucked in as must have been in the stomach of that animal. I submit, and that respectfully, that the idea of *sucking in air* ought to be exploded. It is an utter absurdity for any man to believe in such nonsense. One would imagine that any physiologist declaring such to be his conviction, that he was entirely ignorant of *himself*, or, in other words, of comparative anatomy, physiology, or pathology, to say nothing of the laws of chemistry.

Nature never intended a horse to crib; this is the first pro-

position ; and the next is, that it is universally believed to arise from indigestion ; and, thirdly, that if continued, structural alteration of parts will take place ; and, lastly, it has been declared that such horses are more liable to colic than others. It does not therefore follow that because an animal looks well, feeds well, and performs his work well, that his internal parts are not diseased. Those of us who have had much experience amongst horses, know that but few horses under our superintendence are entirely free from some complaint or other, and yet they do their work. If we turn to the human subject, we find numberless instances of men and women whom we know to have diseased structures; still they do their ordinary business, but certainly not with the same degree of *comfort* to themselves as if they were free from disease. In closing this I would merely add that it does not prove, then, that diseased structure cannot, or does not exist, because we are not in a position to demonstrate it.

A crib-biting horse is, to all intents and purposes, an *unsound* one. He should be denominated, if nothing else appears against him, a *practically* or *usefully sound* horse.

(*To be continued.*)

DIFFUSE CELLULITIS (CELLULAR ERYSIPELAS) SUPERVENING ON CASTRATION.

BY J. MATTHEWS, F.R.C.V.S., A.V.D., 17TH LANCERS, LUCKNOW.

THE following case being of somewhat uncommon occurrence, it may perhaps interest the readers of the VETERINARY JOURNAL.

Early last month I was asked to operate on a vicious mule, the property of a trooper (sowar) in the 2nd Bengal Cavalry. The age of the animal was twelve years, and it had been bred in the Punjab. It had been decided to castrate it with a view to rendering it more tractable. The testicles were removed on the 9th May, the cords being divided by the actual cautery ; little tumefaction followed, and recovery seemed certain, until the 24th, when a downfall of rain occurred, succeeded, as usual, by intensely muggy, steamy weather. Thermometer was 98° F.,

and a steady east wind set in. The wounds in the scrotum, which had nearly healed, discharged sanious fluid, and looked unhealthy, whilst along the back there was a swelling over the *longissimus* and *latissimus dorsi* muscles, acutely sensitive to pressure, which, if continued in either direction, produced a faint crackling sound. Pulse full and 53. Acute pain was evinced when the patient was moved, and when left to himself he stood with a look of extreme dejection, and gathered "in a heap." The bowels were constipated.

A purgative was at once administered, and occasional enemata. Locally, a hot, wet blanket, well wrung out, and covered by a dry one, was kept over the back. The next day the pulse was 48 and the artery more relaxed ; but there was no disposition to eat, though, generally, the mule was more comfortable in appearance. The wounds in the scrotum were enlarged by the finger, and well syringed with warm water. The swelling on the back pitted slightly on pressure, which caused less pain than at first. The purgative took effect in the evening. Repeated doses of Sal ammoniac in water were given, and these he drank freely. There was little change for five days, except that the appetite gradually returned. The east wind now dropped, the swelling rapidly disappeared. The animal recovered, and has since rejoined, much improved in manners by the operation.

It is curious to note that I had six other patients in different parts of the cantonment recovering from this operation, all of which were more or less affected by this change in the weather, though healing very rapidly till the rain fell, the wounds, for the time, assuming an unhealthy appearance.

One case—a chestnut arab, aged, on which I had operated by torsion about five days previously, became affected with chronic spasms of the muscles of the neck, abdomen, and hind legs, though not involving the *retractor oculi* muscles. A strong cathartic was administered, and as the bowels responded the spasms diminished in frequency and intensity. Local means were taken to reduce irritation, and the wounds were kept clean, etc.

VETERINARY REPORT ON BENARES.

BY VETERINARY SURGEON R. W. BURKE, M.R.C.V.S., A.V.D., BENARES.

(*Continued from page* 13.)

Case 68, G 48. Admitted on the 14th of May. There appear on the mane and tail—parts covered with longest hairs—numerous little *papules*, some of which, during their growth, and from the nutrition of the cuticle being destroyed, are covered on their surface by *minute* white crusts, and presenting an appearance which is pathognomonic of this disease, the formation of these crusts being copious and attended by considerable itching, and, in the later stages, by heat, soreness, and other symptoms of acute but superficial inflammation, owing to the parts being rubbed by the animal from extreme Prurigo. Potass. nitras. ʒiv. in water to drink, morning and evening, by way of relieving cutaneous hyperæmia, by causing hyper-action of the kidneys instead. Give a physic containing Aloes Barb. ʒiii. p.; Pulv. zingib. ʒiii.; ft. bol. Clothe the body warmly during the action of the purgative prescribed. Allow plenty of cold water to drink, and linseed one pound per diem in addition to his ordinary ration. Locally, applications of kerosine and cheerpine oil, diluted with equal parts of Ol. lini., after first clipping the hair of the affected parts—to be rubbed in with friction of the hand.

June 5th.—Has had several applications of the above, and was washed in the interval with soap and warm water. This case has made a good recovery in the short time it has been under treatment, when compared with some of the other cases of a similar type. Prescribed tonics for the next few days.

June 14th.—Discharged cured.

(*d*) *Erythema.*—Here, again, I was obliged to omit a great number from the register of sick horses, owing to its great prevalence, but non-severity of most cases, noting only the worst, which required special treatment. I will only describe the course and treatment of one case, from the record of treatment:—

Case 91, G 97. *Erythema*,—Admitted on the 25th of July.

Circumscribed patches of superficial inflammation of the cutis, covering the neck, shoulder, etc. Prescribed a cathartic; blanket to body.

July 26th.—Bowels relieved; alkalinated water to drink. Locally, applications of Ol. terebinthinæ puræ.

August 29th.—Has had several applications of the oil of turpentine, and appeared better and worse. Alternate this dressing with that of "phenyle," conveniently diluted with water to make a milk-like lotion. Allow, with his daily feed, Sulphur sub. ʒiv.

September 8th.—Much improved; the lumps in the skin have all receded, especially since the phenyle dressings have been employed.

15th.—Discharged cured.

(*e*) "*Bursatti.*"—Any description of the pathology of this disease to be adequate, must require a comprehensive answer, and greater consideration than this report demands; therefore I defer minute description of the subject to another occasion. I would only express my conviction, already given, that I regard the disease as in every respect analogous to that variety of Cancer in man which has been specially studied and described by Billroth—a summary account of which may be seen in the recent edition of Wilks and Moxon's work on "Pathological Anatomy," and elsewhere. Whether we consider the histological, macroscopical, clinical, or pathological aspects of these "two diseases," their identity becomes equally established; and I cannot, in view of these facts, assent to the parasitic theory of the disease that has been advanced, which is based on hypothesis, and will not stand the test of competent inquiry. I may add that specimens of the sores lately submitted for examination at the Brown Institution, London, failed to prove the parasitic nature that was previously claimed for the disease by some veterinary surgeons. And Dr. George Thin, a leading microscopist in England, also denied this view of the disease after a careful examination of the morbid products made on a former occasion.

The disease is both non-infectious and non-contagious. It cannot be inoculated. I have myself inoculated, this year, five ponies and several dogs (which I had caught for my experiment

at two annas per dog), by introducing subcutaneously appreciable quantities of the discharge, or tissue detritus, from the sores of horses so affected; but in no case was the disease reproduced, although I watched the history of some of my patients after inoculation for over two months, and one for a little over five months. Intravenous injection has been already tried, with similar results. It is, therefore, non-communicable.

*Pathological Anatomy.**—Speaking from previous experience of the disease, I must observe that exactly those changes found *post-mortem* in cases of Cancer are found on *post-mortem* examination of horses that have died of, or been destroyed for, Chronic Bursatti, viz., pseudo-tubercles in the lymphatics and viscera, especially in the lungs and liver; (2) changes peculiar to Fibroid Phthisis in man are found here, with indurated "lumps" scattered throughout the pulmonary texture, the result of fibroid substitution; (3) total absence of suppuration in connection with the lesions found *post-mortem;* (4) the presence of numerous pseudo-bronchi seen on cutting the lungs, which on closer examination are found to be cavities emptied of "kunkur," or pseudo-tubercle, above described.

Clinical Characteristics.—Absence of true suppuration in the sores externally seated, the discharge from the latter being more of the nature of *tissue-slough*, or sero-sanguineous in character, but seldom partaking of the character of true pus, except when due to accidental irritation of the surrounding tissues, brought about by various causes, such as that produced by the action of the air, by irritant caustics used, and so on.

Recurrent Nature of the Disease.—I am aware that a period of *respite* characterises the history of the sores, during which time apparent "cures" have been said to have been established. This feature of the disease is very deceptive, however, and apt to confound proper statistics being drawn of the disease, as it is seldom finally eradicated, except in very rare instances; and those who think they have "cured" Bursatti are furnishing only another instance of the many cures said to have been established in cases of Cancer in man. A respite, in our opinion, does not constitute a cure proper of the disease.

* I may state that this portion was omitted from the report submitted.

Periodicity.—I would object to the use of this term here, as meaningless. When I say that I have seen the disease occurring during every month in the year, and recurring as indiscriminately with regard to any proper time, the notion that it is confined only to the season of the rains will be at once dispelled. I would observe, however, in this connection, that, in the majority of cases at least, the *severity of disease*, when present, *is* pronounced in the wet weather more, perhaps, than it is so during other months; and this fact is not without explanation. The solution of the problem is already forthcoming when we reflect on what has yet been ascertained in respect of the clinical history of Cancer in man. It is held by Dr. Moxon* that this feature of the disease, Cancer, is explicable on the ground that it is characteristic of Cancer structure for its cell changes to become augmented in proportion as the moisture that is applied to it; and is it incomprehensible to understand, then, how this moisture in the atmosphere, during wet seasons in India may, and does, increase the morbid process in the sores in proportion as it is found greater than during other seasons, and give respite to the disease in proportion as it subsides again at the approach of autumn, as it is seen to do in the large majority of cases at least?

Mortality.—In this feature alone Cancer of the horse differs, perhaps, from Cancer as it occurs in man. It runs a more rapid and fatal course in the latter, whereas it is less rapid, less fatal and insidious and deceptive in its behaviour in the system of the former. Probably this is in great part explicable on the ground that our equine patient is less susceptible to taking the disease in the more acute form as often seen in man. Yet it cannot be denied that the same cachexia, the same debility recorded as characterising the subsequent history of human Cancer, are seen characterising also the history of equine Bursatti during the later stages. And if we refer to the experience of some of our most practical veterinarians in the country on this point, we find it stated on their authority that many cases of Bursatti have terminated fatally, just as most cases of Cancer terminate fatally in human practice. Indeed, several cases are within my own recollection where the subjects of Bursatti were, during

* Jones and Sieveking's "Pathological Anatomy."

subsequent attacks, and sometimes in the first attack, that reduced in condition, from general blood dyscrasia, that they were a spectacle much too cruel and painful to behold, and were therefore shot, or otherwise destroyed. Moreover, the mortality of the disease in man is greatly heightened by recourse to operation, which is admitted by all practical surgeons to increase, instead of diminishing the activity of the disease process, bringing about rapid death ; whereas the horse is seldom subjected to this mode of treatment for Bursatti.

Temperature.—A total absence of pyrexia characterises the first stages of this disease, as in Cancer in man ; and it is not until the later stages, when exhaustion supervenes, that the temperature is at all heightened in either patient.

Specific Properties.—It occupies an intermediate position in the boundary line between truly specific and sporadic affections. (*a*) It is non-contagious. (*b*) It cannot be inoculated to the same or other species, all experiments thus conducted having failed to reproduce the disease in another animal. (*c*) It runs no definite course, but is insidious and irregular in its action, and depends for its activity on that some irritant be applied to it in the shape of an exciting cause.

(*f*) *Liver Disorders.*—Considering the character of the climate peculiar to the district, which is hot and moist, the number of cases of liver and skin disorders would naturally be expected to be high. In point of fact, however, this holds true only as regards the latter, of which some of the worst alone have been recorded, disease due to derangements of the liver being comparatively few ; indeed, only five, which showed symptoms of pronounced illness, received any remedial treatment, the others being left to the work of nature to overcome.

Herewith the course and treatment of a case, from the record of treatment :—

Case 53, G 6.—Fever, bilious. Admitted May 1st. Has only just recovered from an attack of "Skin Disease" (Ptyriasis), and is said to have suffered similarly during previous years. Presents an icterous condition of the visible mucous membranes, accompanied by slight febrile symptoms ; dulness of demeanour, loss of appetite, constipation of the bowels, and fœtid, mucus-coated

fæces; pulse, 54, and weak; temperature, 101·4° F. Aloes Barb., ʒiij; Pulv. zingib., ʒiij; mass. comm., q. s., ft. bol. Warm clothing to body during the action of the cholagogue prescribed. Sinapism to region of liver. Et, Spts. ether nit., ʒiss; Camphora, ʒij; Pot. nit., ʒiij; Aqua Oi, ft. haustus, every four hours.

May 2nd.—Bowels relieved, fæces unusually dark in colour, very fœtid, and containing much mucus and water. Continue febrifuge medicine, above described, twice daily. Plenty of cold water to drink, to assist the action of the cathartic administered.

May 3rd.—Fæces still offensive, and mixed with mucus shreds. Jaundiced condition of the membranes less marked. No fever. Pulse, 38, and very weak; temperature normal; appetite regained. Prescribed the same medicine for the next few days, conjoined with tonics; Et, Calomel ʒss, in elect. Ordered bran mashes and plenty of lucerne grass. Daily exercise.

May 5th.—No pyrexia. Pulse, weak and irregular. Increased the dose of ferrous sulphate to six drachms per diem, combined with Pot. iodid. ℈i twice daily.

May 8th.—Convalescent. Daily walking exercise and tonic medicine. Liberal diet.

May 25th.—Debility is the only symptom remaining, as evidenced by the loss of muscular condition, pallid membranes, weak pulse, etc. Put on ordinary daily ration, with an extra pound of linseed per day, and plenty of lucerne and guinea grass from the battery beds. Tonics.

July 15th.—Tonic medicine, good feeding, and daily exercise, have been had recourse to uninterruptedly, and the animal has slowly gained in condition. Allowed rest, good feeding, and walking exercise till the end of the month, when he was discharged. Has proved a protracted case.

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 29.)

As a pathognomonic sign of this affection, he considered the existence of the caseiform matter contained in the tubercles—matter which, according to him, consisted in a mass firm at first, then granulous, and latterly purulent; this mass is always homogeneous, opaque, white, yellow, or greyish in tint, and may be present in the form of enkysted or non-enkysted tubercles.

Laënnec followed the path indicated by Bayle, but he simplified the subdivisions created by him; he admitted only one kind of Phthisis—Tuberculosis—and declared that Scrofula was tuberculous glands; and he included under the general designation of *Phthisis tuberculosa*, Scrofulosis, which he qualified as Tuberculosis of the lymphatic glands.

Microscopical investigation became gradually extended, and it was soon imagined that particular elements had been discovered in the tuberculous matter—the "tuberculous corpuscles." Cells of different forms were found, which some investigators considered were emigrated leucocytes of the blood, and others thought were epithelioïd cells. It was only at a later period that the presence of giant cells, containing numerous granules, were noted in the tubercles; some observers even pretended to have observed a fine network containing cells in its meshes; but it was soon perceived that neither the epithelioïd nor the giant cells were characteristic elements of tubercle.

The labours of Virchow gave a new aspect to the theory of Tuberculosis. The learned Berlin professor proved that all caseous matter was not necessarily tuberculous; for, said he, if tubercles caseify, other neoplasms also undergo this transformation. According to him, we should only qualify as tubercles the caseous products derived from sub-miliary non-vascular nodules, composed of spherical cells similar to the white corpuscles of the blood, not exceeding the size of a grain of millet, and at a late period undergoing caseification.

Virchow has recognised that, at the same time and in certain circumstances, tubercle is nothing else than an inflammatory

product, and that it is an *infectious* affection; and he establishes a distinction between Tuberculosis and Scrofulosis, Caseous Pneumonia, inflammatory exudates, and different neoplasms.

About the same period, Buhl also published his opinion that Tuberculosis was an infectious, and at the same time specific malady, and maintained that the tuberculous virus may be formed not only in the tubercles, but also in the caseous centres.

Finally, Villemin, by his important experiments, already referred to, demonstrated that Tuberculosis was undoubtedly an infectious malady, and that the virulence of the tuberculous matter is precisely the *criterium* of the tuberculous nature of a product.

From this time observers and experimenters have endeavoured to discover and to isolate the tuberculous virus from the morbid matter, and to study its exact nature.

Koch has solved the problem in demonstrating, by certain microscopical arrangements and special staining, the existence of certain minute elements, hitherto unobserved, in all the organs affected with Tuberculosis; these elements are veritable *Bacteria*, and their presence is characteristic of Tuberculosis.

As important consequences follow this precious discovery, we may allude to it for a moment.

According to Koch, the *Bacteria* of tubercle manifest themselves in the form of threads of extreme tenuity, in length scarcely one-half the diameter of a red blood-corpuscle, and in breadth at most one-fifth of their length. They are non-motile, without proper motion, and form spores, which are developed during the life and in the body of the affected creature. They are never mixed with micrococci or other *Bacteria* in tuberculous centres protected from the air. Therefore it is that we find them unmixed in recently-formed tubercles, though they are often accompanied by other proto-organisms in sputa or vomicæ —in a word, where the air may come into contact with them.

In all cases in which the tuberculous affection is at its commencement and is making rapid progress, the *Bacteria* are in large numbers; but when the disease is developed slowly, these proto-organisms are only met with in small quantities in the parts altered by the disease, and they may even be entirely absent in the places where the malady remains stationary.

Koch does not wish it to be concluded, from the existence of *Bacilli* in the tuberculous neoplasms, that these parasites are the agents which cause the formation of the growths ; for though he is led to believe that a close connection may exist between them, it is as yet merely a conjecture, which can only be established as a fact after further researches.

In order to prove that Tuberculosis is a purely parasitic malady, caused by the invasion of *Bacilli*, and especially by their growth and multiplication, it is necessary to isolate and cultivate them in a state of purity, free from every heterogeneous element and until every morbid product from the tuberculous animal and which might adhere to them, is got rid of. This Koch has done, and these isolated *Bacilli* he has transplanted in animals, and by this inoculation he has produced the morbid phenomena of Tuberculosis, such as are observed following experimental inoculation of the virus.

It was only after numerous attempts that Koch was enabled to obtain these pure cultivations ; and with this object, he employed as cultivating fluid the serum of cow or sheeps' blood, sterilised, and kept at a temperature of 37° to 38° Cent. In this artificial soil, the tubercle Bacilli only developed at a temperature of 30° to 41° ; and the cultivations obtained in favourable conditions appeared to the naked eye in the form of small dry scales, which scarcely adhered to the gelatine or nutritive serum, which they never fluidified, as do the *Bacteria* of Anthrax. These scales or films only became visible towards the second week of cultivation—usually after the tenth day, and they grew so slowly that it was only about the third or fourth week that they attained the size of a poppy seed. These peculiarities, special to such cultivations, distinguish the *Bacilli* of Tuberculosis from all others yet known. Whether the *Bacilli* are obtained from human or animal tubercle, the result of cultivation is always the same ; there exists no difference between the *Bacilli* of these two groups of tubercles.

By the inoculation of the *Bacilli* thus cultivated in the pure state, inoculation tubercles have been produced, with all the characters of ordinary tubercles, in experimental animals, and this even when the quantity of matter inoculated was very small.

In the intentionally-produced neoplasms, the *Bacilli* were constantly present, and when removed from the growths they could again be cultivated and again be successfully inoculated.

By numerous researches properly controlled, Koch has proved that it was impossible to produce the typical alterations of miliary Tuberculosis by the inoculation of other matter than the *Bacilli;* and he took great care, in his experiments, to adopt the necessary precautions to avoid confusing their results with spontaneous Tuberculosis, as well as to keep the experimental animals from exposure to any fortuitous cause of infection.

From his researches, Koch concluded that *the presence of Bacilli in the tuberculous masses constitutes not only a concomitant fact in the tubercular process, but that it is the cause; and that we should see in the Bacilli the cause of Tuberculosis—a cause which had hitherto only been suspected, and which presents itself to us in the form of a vegetable parasite.*

Koch found exactly the same pathogenic parasites in the miliary nodosities from the lungs of eleven people affected with miliary Tuberculosis; he has also always found them in the tubercles of the spleen, liver, kidneys, pia mater, and in the caseous bronchial glands; as likewise in cases of Bronchitis and caseous Pneumonia (in six cases with formation of caverns, in the majority of which the *Bacilli* were very numerous), in an isolated cerebral tubercle the size of a nut, in tuberculous nodules developed around ulcers in the intestines in cases of intestinal Tuberculosis (two cases), in scrofulous glands recently removed (two or three cases), and in fungous Arthritis (two of four cases).

Koch has also found the same parasites in *ten animals affected with Tuberculosis, and which had calcareous nodosities in their lungs; several times he has discovered them in nodules on the peritoneum, as well as in the bronchial and mesenteric glands.* He has also found them in three cases in which the lungs did not present those characteristic nodosities with rounded surface, which are observed in ordinary Pulmonary Tuberculosis; in these cases, in the lungs there were spherical nodosities, with smooth-walled cavities, filled with a thick, pulpy, and caseous matter. This is a form which is not usually regarded as Tuberculosis.

The presence of *Bacilli* was also remarked in a lymphatic gland from the neck of a *pig*, in the organs of a *fowl* which had died of Tuberculosis, in the tuberculous nodules from three monkeys, nine *guinea-pigs*, and seven *rabbits*, which had died naturally. Besides these cases, which may be said to be spontaneous or accidental Tuberculosis, Koch examined thirty-two rabbits, seventy-two guinea-pigs, and five cats intentionally infected by tuberculous matter, and in all he found the *Bacilli* in the pulmonary tuberculous nodosities.

The facts established by Koch have been confirmed by the investigations of the principal authorities in mycology and pathology. These facts have not yet been seriously contested, and they demonstrate that, with regard to etiology, human Tuberculosis is identical with that of animals. The researches of the illustrious Berlin *savant* possess the great merit of having again drawn attention to the question of the consumption of the flesh and milk of phthisical animals, as well as to the care to be observed in vaccination.

In addition to the facts furnished by the discovery of Koch, which has settled the question as to the identity of human and animal Tuberculosis, reference should be made to the valuable investigations in this direction by Villemin and Klebs. These two able experimenters have demonstrated that *tuberculous matter derived from man will produce Pulmonary Phthisis in animals, and this inoculated Phthisis may be transmitted, by inoculation, to other animals.*

It can readily be understood that experiments to prove the transmission, *by inoculation*, of tubercular Phthisis from animals to man, with the object of producing Tuberculosis, must be excessively rare. With regard to inoculation from man to man, it is reported that Demet, Paraskeva, and Zallonis, inoculated with the sputa of a tuberculous patient, a person dying from progressive gangrene of the big toe, and who was apparently free from tubercles. He died thirty-eight days after inoculation, and on *post-mortem* examination recent tubercles were found in the two anterior lobes of the lungs.*

* *Fleming :* "British and Foreign Medico-Chirurgical Review," 1874, p. 473. *Johne :* "Geschichte der Tuberkulose." 1883.

The following case of transmission of bovine Tuberculosis to man, related by Dr. Stang, of Amborach, has gone the round of the medical press. A boy, five years old, apparently strong in constitution and descended from healthy parents, whose progenitors were exempt from hereditary disease, was attacked with Scrofula, and died in four weeks from Miliary Tuberculosis of the lungs and enormous hypertrophy of the mesenteric glands. When making the autopsy, it was accidentally ascertained that some time before the parents had to destroy a cow, which, according to the testimony of the veterinary surgeon, was affected with Pulmonary Phthisis. The animal had been a good milch cow, and for a long time the boy had received a quantity of the milk, immediately after it was drawn.*

Another argument in favour of the identity or close relationship between *Tuberculosis of man and of animals, is to be found in the analogies existing between these two diseases in regard to contagion and heredity.*

* It is very difficult to trace infection from diseased cows to mankind, as there are so many obstacles and objections to be overcome in accepting, as conclusive, evidence in favour of direct transmission, either through the flesh or milk. At most the evidence is only presumptive ; but it is by no means scant, and might be largely supplemented if inquiry were made.

For instance, in the discussion on Tuberculosis, at the meeting of the National Veterinary Association, held in London, in May, 1883, Mr. Hopkin said : " If we feed children on diseased meat, will it produce Tuberculosis now or ten years hence? I had an assistant who came to me from one of the islands on the coast of Scotland. The family from which he was derived was healthy and strong ; but when two of his sisters were young, the herd of cattle became affected with Tuberculosis. These girls were fed upon milk from these cattle. The two brothers, who were more fond of whisky than milk, are still hale and healthy—the sisters are lying in their grave, victims to Tuberculosis."

Human morbid anatomy also furnishes what may be deemed presumptive evidence, such as is given in Creighton's " Bovine Tuberculosis in Man." Judging from analogy, there can be little doubt that the disease is transmissible from animals to mankind, and the fact would be demonstrated very speedily if experiments could be resorted to. At the above meeting, at which I was president, in alluding to this point, I made the following remarks : " A great difficulty we meet with is that, while we can experiment upon animals to prove the transmissibility of the malady from one to the other, we cannot do so with regard to the human species. Gentlemen, it has struck me that we sometimes waste human life—that we throw away very good opportunities for experiment, by the manner in which we dispose of our criminals. I think no better use could be made of those condemned to death, than by experimenting in this direction. We know that if animals be fed for a certain time with tuberculous matter, serious changes will take place in their bodies, although they may appear to be in perfect health. I do not know whether the hypersentimental people, the moralists of this country, would tolerate such a proce-

From what has been observed in human embryos and the dead bodies of new-born infants, it would appear that Tuberculosis is hereditary.

Walshe* has demonstrated that this disease, in man, has the same favourable influence in the production of sterility and abortion as in cows.

Grisolle† and Dabreuille‡ have combated the old and popular belief in the favourable influence that pregnancy should have on the development of Pulmonary Tuberculosis. If that is admitted in human medicine, it is merely supporting a fact which has been for a long time accepted in veterinary medicine.

Since the time of Galen, a great number of physicians have maintained that Tuberculosis is contagious. Among these may be cited Morton,§ who states, with regard to the causes of this malady: "*Contagium etiam hunc morbum propagat. Hic enim effectus* (*uti frequenti experientia observari*) *lecti socios miasmate quodam sicuti febris maligna, inquinat.*"

Van Swieten‖ says: "*Phthisis contagio afficit ab fœtore sputi.*"

Home mentions, among the causes of Phthisis, contagion as *causa procutarica.*

Maret has known many people succumb to Phthisis who were not at all disposed to the disease, but contracted it by wearing clothes previously worn by phthisical persons. Among others, he gives three instances which clearly show that sleeping with phthisical people may transmit the malady.¶ In consequence of this occurrence, he declared that it was dangerous to have close relations with phthisical persons, and he announced the fact publicly.

dure; but I do think that criminals who so far offend against society as to take away human life, should thus be made to atone to that society whose moral principles they have violated." Feeding, or even inoculating, such criminals with tuberculous products, in order to discover whether, after execution, these products have induced the pathological alterations noted in animals so treated, would decisively, and for ever, solve a very serious problem in the sanitary condition of mankind.—G. F.

* The *Lancet*, July, 1850, p. 5.

† "Archives Generale," January, 1850, p. 41.

‡ "Gazette des Hopitaux," 1851, No. 118. "Bulletin de l'Academie de Médecine," Vol. XVII.

§ "Opera Medicin," Lib. II., p. 36. Edib. ult. Amstelodami.

‖ "Commentaries," Lib. IV., p. 72.

¶ "Esprit des Journaux," Paris, 1779.

Other examples of transmission of the malady from man to man are given by Pothius, Schmidt, and Kruger,* and in *Hufeland's Journal.*† This is what we read on the subject: "The contagious power of Pulmonary Phthisis, which has been several times observed, has been lately confirmed in a very evident manner. A young farmer, in perfect health, received a present of shirts and clothes which had been worn by a person who died of Phthisis. He wore these articles, and in six months was dead from Phthisis." The writer adds: "How often may the unknown cause have been perhaps in the clothes or the beds used by phthisical people, and how difficult it is to discover the danger to which we are exposed in sleeping in a bed previously occupied by we know not whom (hotel or lodging-house bed)? Should it not be the duty of those who are entrusted with the sanitary service to see to the destruction of all the clothes, shirts, and beds which have been used by phthisical people in their last moments, as is prescribed by the Italian legislature? In all these cases, at least, these beds should only be used again after the flock (*duvet*) has been washed and exposed to the air for a year."

Fritzen‡ gives some instances of contagion. He says: "The very judicious observation of a great number of physicians, that Pulmonary Phthisis is contagious, has been confirmed in my long experience. A domestic inherited from his master, who died of Phthisis, several suits of clothes, among which was a vest which he wore some time afterwards, without taking the precaution of washing it. Four weeks later the early symptoms of Phthisis manifested themselves, and he died in six months. A young woman in very good health, one of a family without any history of Phthisis, was married to a phthisical man, in whose family there had been several deaths from Tuberculosis. Some years after marriage, the woman became ill and died of Phthisis. The husband, who was fifty-two years of age, again married. His second wife, who was in perfect health at the time of marriage, subsequently died of Phthisis." After relating these facts, Fritzen adds that Phthisis is more especially transmitted

* "Ephemerides Naturæ Curiosorum, decuria," I., II., III.
† Vol. VII., chap. i., pp. 34, 35.
‡ "Medic. Annalen," Vol. I., p. 231.

from husband to wife, and *vice versâ*.* He recommends the prohibition of marriage with phthisical persons, and urges that the beds and clothes which have been used by tuberculous people be cleansed and disinfected.

Cullen, who did not think the affection was contagious, nevertheless did not deny the possibility of its transmission. This is the way in which he expresses himself: "Many physicians consider Phthisis as contagious. With regard to myself, I will not affirm that it is never transmitted by contagion. Nevertheless, among a great number of phthisical people whom I have had occasion to treat during my long career, I have scarcely met with an instance in which I could invoke contagion as a cause of the disease."† At a later period he published an instance to which a celebrated physician of Groningen was an ocular witness. "A young man predisposed to Phthisis, married a young Dutch woman of a sanguine temperament and good constitution. Some days after their marriage the woman lost her fresh colour and was affected with a bad cough; a month later she discharged bloody sputa. The doctor advised her not to sleep any longer in the same bed with her husband, but she would not take this advice; in six months she died of Phthisis. The nurse who waited upon her, and the domestic who, as a measure of prudence, was seldom in the bedroom, succumbed to the same disease." Cullen adds: "In all cases, Phthisis is more quickly and certainly propagated in hot countries than elsewhere; perhaps with us (in Edinburgh), the contagious principle does not become sufficiently potent to produce its injurious effect except in fine weather, when the hectic transpiration supervenes."‡

At Rome, and in Italy generally, they are careful to conform to a police regulation which prescribes burning everything used by phthisical people.§ It was for this reason that the greatest physicians of that country, among whom may be men-

* I have known one instance in particular, in which a fine, strong, healthy man, whose wife suffered from Phthisis for some years, and died, became affected.—G. F.

† "Anfangsgrunden der praktischen Arzneiwissenschaft." Leipzig, 1870. Part II., § 553, p. 211.

‡ "Auszuge aus den best. Franz. Period." Schriften. Vol. III., p. 340.

§ *Wichmann:* "Hannoverischen Magazin." 1780.

tioned Morgani,* Valsalva, and Sarconi,† refused to make the *post-mortem* examination of phthisical persons. In that country it was even believed that in Tuberculosis, as with Leprosy among the Jews, the virulent matter was communicated through the walls of houses. Impressed with this idea, the Italians abstain, often for a whole year, from inhabiting a house in which a phthisical person has died.

In Portugal the beds and clothing of phthisical people are also destroyed.

In a work published in 1780, Dr. Wichmann, court physician at Hanover, gives, in a *résumé*, the views of many physicians and the laity as to the nature and contagious character of Phthisis a century ago. Alluding to the propagation of this affection, among other observations it is mentioned that at Zurich it is so prevalent, that one in every six cases of death is due to it. Yet the belief was that it is not so rapidly contagious, and does not so quickly alter or poison the air as the Plague, Variola, Scarlatina, or other maladies accompanied by a cutaneous eruption; though he asserts, at the same time, that the diseases which are characterised by the appearance of an exanthema or any other alteration of the surface of the skin, are not those which are capable of being transmitted by contagion. Many other affections, he adds, in which there is no eruption, may likewise be communicated by contagion, though the process is slower; contamination is less easily and less frequently effected through the medium of vehicles—that is, indirectly; transmission only occurs *when exposure to infection is frequent or long continued.*

Wichmann says, in addition, that he does not fear the objections of the orthodox, who would doubtless treat him as a heretic, because of his ideas as to the contagiousness of Phthisis. The anathemas of these persons he despised, as every observant physician might find at the bedside of his patients and in the midst of his *clientèle*, convincing proofs as to the reality of the fact he advances. He reminds those who deny the contagious-

* "De Causa et Sedibus Morborum Epist." 22-3.
† "Del Contagio del Vajuole," 1770.

ness of this malady,* that if scepticism is very useful in medicine, as well as in the other sciences, it may nevertheless lead to culpable indifference. He cites several instances of transmission of Tuberculosis between married people, and insists upon the necessity of preventing marriage with a phthisical person. As a preventive of Tuberculosis, he proposed the inspection of shops where were sold old beds or clothes which might have been used with phthisical persons, and insists on the urgency of not allowing children to cohabit with people affected with Tuberculosis.

If Wichmann's opinion has not received all the attention it deserved, neither at the time nor subsequently, the scientific experiments made eighty or a hundred years afterwards by Villemin and Koch have none the less proved its justness and reality.

The number of observations relative to the contagiousness of human Tuberculosis, especially between husband and wife, are daily accumulating to such an extent that the list of physicians who do not believe in the possibility of its transmission is progressively diminishing ; while clinicians, guided by the scientific discoveries already made, recognise more readily the ways in which the tubercle virus may be transmitted. If it be true that among these ways, that which conveys it from animals to man has not been appreciated as it ought to be, its existence has, nevertheless, been sufficiently suspected to lead to the notion that there was in the bodies of tuberculous animals some principle or factor which was noxious to mankind.

We will allude in more detail to these facts in the next chapter.

In summing up the data which we have dealt with in the preceding pages, we arrive at the conclusion that all the evidence points to the fact that the Tuberculosis of mankind and that of animals is one and the same disease, which, more than any other, chooses its victims from among warm-blooded animals, irrespective of species, provided they live in agglomerations.

The following are the conclusions at which we have arrived :

1. Tuberculosis has been observed in all warm-blooded animals submitted to domesticity or deprived of their liberty.

* "Die Schwindsucht, eine Polizeiangelegenheit." Hannöverischen Magazin, Chap. 51. 1780.

2. Tuberculosis in animals and mankind presents analogous manifestations, in the living as in the dead creature.

3. The course and termination of the disease in mankind and animals is the same.

4. The masses of tubercle, and especially the sputa of the phthisical, produce Tuberculosis in animals, when these matters are introduced through the respiratory or digestive apparatus, or through a deep wound. Tuberculosis, inoculated from man to animals, may in its turn be transmitted from one animal to another, and always produces Tuberculosis.

5. Tuberculosis of man and of animals is transmitted by heredity.

6. The disease is contagious in man and animals.

7. There are clinical observations which prove the transmission of Tuberculosis from animals to man, by the consumption of the milk of phthisical animals.

8. Tuberculosis of animals and man is rare in cold climates, where it does not even appear to be developed. It is most frequent in southern countries ; the tracings of the geographical propagation of the disease in man and animals are nearly parallel.

9. It is evidently proved that a pathogenic microbe, having the same morphological and biological characters, exists in the tubercle of man and in that of animals. This organism, whether it be developed in man or animals, may induce Tuberculosis when, cultivated in a pure state, it is conveyed to the animal possessing the necessary receptivity.

When we consider that man derives a large part of his nourishment from the animals around him, we can scarcely doubt that an intimate causal correlation exists between him and them, with regard to this disease. If we carefully analyse the facts at our disposal, we shall find, concurrently with centres of Tuberculosis in animals, more or less numerous cases of Tuberculosis in man. We shall note that, for the production of the disease in the human species, it is not absolutely necessary that there should be close vicinage between mankind and diseased animals ; the relations between both may be very effectively established through the indirect medium of the flesh and milk, sometimes consumed a long way from the locality in which they are produced.

The facts which we have adduced sufficiently prove the reality of this state of affairs.

As has been already said, it is more especially in dwellings containing animals exclusively destined to furnish milk or flesh, that Tuberculosis makes its ravages; and these are precisely the dwellings which supply food to towns and industrial centres. The circumspect breeder is always on the alert with regard to the animals bred and reared by himself, and he is always anxious to dispose of them whenever they show any suspicious or morbid symptoms. These animals come in contact with others, and communicate to them the germs of the transmissible diseases with which they may be affected. In this way they introduce contagious diseases into the stables of dairymen and graziers, and ultimately, after a comparatively brief interval, the animals arrive at the butcher's establishment.

When the foci of animal Tuberculosis are met with in the great centres of human populations, we need not be surprised to find in these centres a large percentage of Phthisis in mankind.

So far as we have gone, we have only examined the question as to the transmission of Tuberculosis from animals to mankind. We ought to bestow a brief glance at the probability of the communication of the disease from man to animals.

Feeders of animals and dairykeepers in the neighbourhood of towns, daily use the refuse of kitchens for feeding purposes. This particular food, which may be sometimes mixed with the excreta of mankind, may convey the morbid matter of the disease under consideration, if the refuse and "swill" is obtained from houses in which there are phthisical people. The observations gathered by some Baden veterinary surgeons, relative to the frequency of intestinal Tuberculosis in cows kept in the vicinity of towns, as well as the fact alluded to by Veith, that the droves of cattle living in a wild or semi-savage state in Hungary are exempt from Tuberculosis, are arguments in favour of this view. From what has been stated, it is established that the correlation between the Tuberculosis of man and animals is a real fact, *and that it is incumbent upon the sanitary police service*

to restrict, or even to suppress as much as possible, the operation of the causes of which this correlation is the consequence.

We cannot terminate this chapter without adding a statistical table showing the comparative propagation of human Tuberculosis and the Tuberculosis of cattle. This table is calculated on the number of 100 persons and of as many cattle, and is drawn up from the reports from the different districts in the Grand Duchy of Baden in 1881. The indications are as exact as possible, as in each commune in Baden there is an official who inspects dead persons, and receives from the medical attendant information with regard to the cause of death, etc., this information being communicated every week to the district physician. In addition, each commune has a meat inspector who keeps a register in which is entered the condition of every animal slaughtered for food, and at the end of each quarter his observations are transmitted to the district veterinary surgeon.

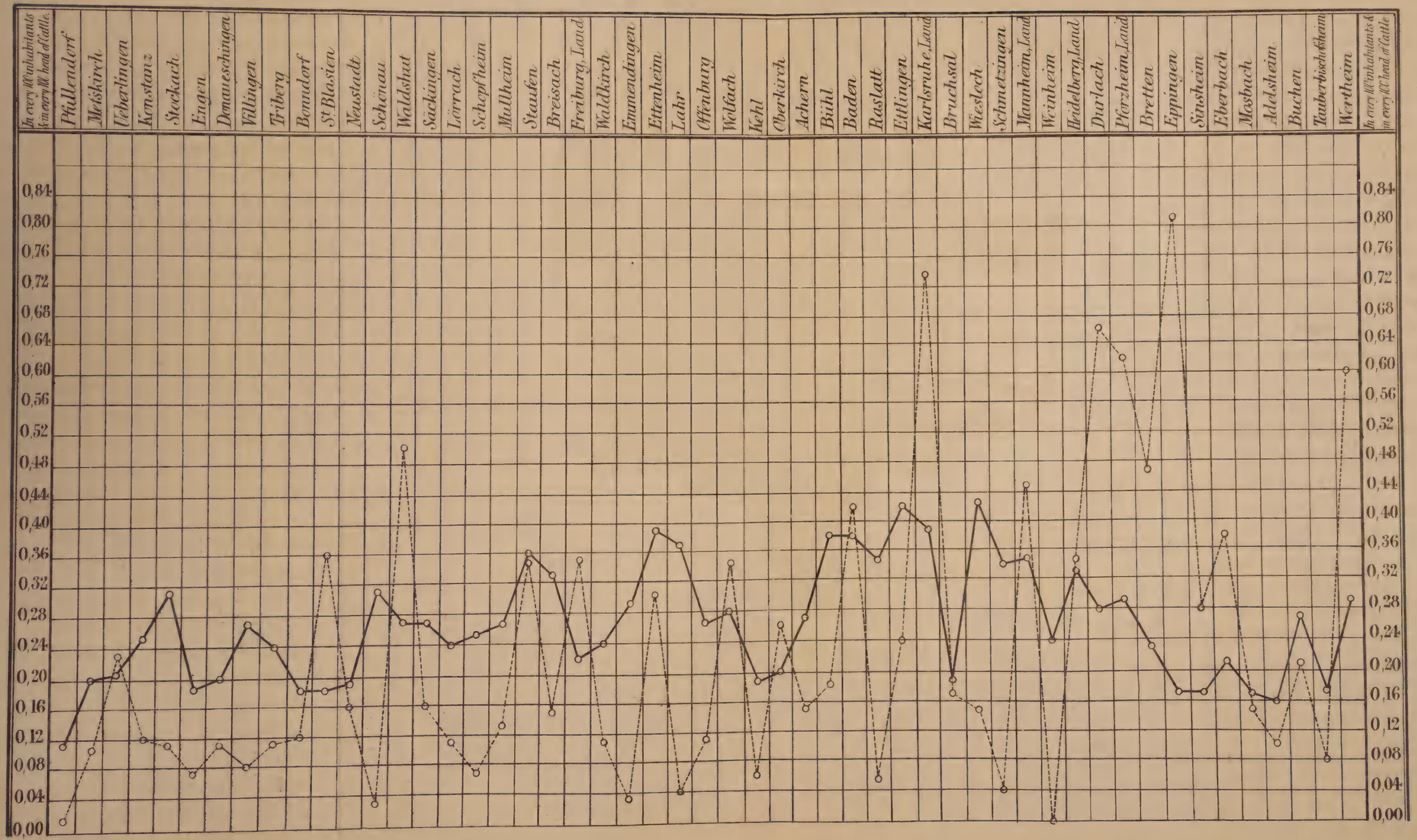
Besides these, the communes have in their service knackers, who are entrusted with the destruction of carcases, and are obliged to keep a register of their operations (information with regard to the number of animals and their diseases); this register is periodically inspected by the police, and is at the termination of the year sent to the veterinary surgeon of the district.

Veterinary surgeons are obliged to furnish, annually, to the Minister of the Interior a report on their professional work, in which they must mention the number of cases and the nature of the diseases they have known or been called upon to treat in the course of the year. All these reports and notices are sent to the government statistical bureau, and serve as the basis for a general report on the number of persons who have died of Tuberculosis, and of cattle which have succumbed to that malady, which have been destroyed because of it, or reported by the veterinary surgeons as being visited by them and found affected with it.

The annexed table, showing the deaths occurring in the human species from Tuberculosis, was published in the general report for the years 1880-81, issued by the Grand Ducal Minister of the Interior.

We have added the curve indicating the number of cases of

TABLE SHOWING THE DEATHS CAUSED BY TUBERCULOSIS AMONG THE PEOPLE, AND ALSO AMONG CATTLE IN THE DIFFERENT ADMINISTRATIVE DISTRICTS OF THE GRAND DUCHY OF BADEN IN 1881.



_____ *Inhabitants* 4494 cases = 0,28 per cent.

---------- *Head of Cattle* 1231 cases = 0,22 per cent.

Tuberculosis observed among cattle in each of the districts of the country. In following the two lines, in that which marks the mortality caused by Tuberculosis in the human species, and that which indicates the frequency of the same disease among cattle, there may be remarked an approximate parallelism in the two curves, if only we omit the arrondissements of Karlsruhe, Durlach, Phorzheim, Bretten, and Eppingen, where are established many butchers who supply meat of an inferior quality to the populous centres in their neighbourhood. The town of Wertheim, in the district of the same name, exports large quantities of sausages made from flesh of inferior quality—a circumstance which readily accounts for the high number of tuberculous animals noted there. It is to be remarked that the districts of Pfullendorf, Messkirch, Stockach, Engen, Villingen, Borndorf, Neustadt, Schönau, Adelsheim, Buchen, and Tauberbischofsheim, are nearly exempt from Tuberculosis, and that very few deaths are caused by Tuberculosis in mankind. It may also be noted that breeding predominates in those districts, into which animals are rarely imported.

It must not be lost sight of, that the figures which include only one year are of little moment, and it is for this reason that we only give them outside that portion of the report which treats of the spread of Tuberculosis in general. The indications found therein seem, nevertheless, to confirm what has been said as to the causes of the propagation of the malady. It remains to be seen whether statistical researches will ultimately confirm or negative the results already obtained. These investigations are now being carried out, and it is to be hoped that they will also be undertaken in all other countries.

Third Question.

What are the Preventive Measures which should be had recourse to, in order to avert the injurious effects which may result from the use of the flesh and milk of tuberculous cattle?

Tuberculosis being a disease, the history of which ascends to emote times, the spread of which is great, and the pernicious influence of which has certainly been recognised for many ages,

the above question has very often been raised during a long period. The country whose civilisation dates from the earliest historic times, had legislative regulations with regard to food, and prohibited the use of flesh from diseased or healthy animals whenever it was considered injurious to the health of man.

In the Mosaic laws, amongst ancient legislation the best known, it is laid down concerning the disease with which we are now occupied, that the flesh of an animal, or a portion of an animal, which has been affected with general or partial Phthisis, must not be utilised as food; nevertheless, infractions of this law were not attended with corporeal punishment. If the malady had only reached the stage that the animal, though emaciated, might yet be supposed to be likely to recover, it was to be killed and its flesh allowed to be eaten.* In order to ensure the execution of the measure prescribed by the Jewish legislation, the slaughter of animals for food could only be performed by special persons, who were also entrusted with the inspection of the flesh, and decided, according to the principles laid down in the Talmud, as to the admission or refusal of this flesh for human consumption.

In the first instance, a particular mark was imprinted on the flesh,† and it only could be exposed for sale and eaten by the Jews.

These ordinances are still in force with the Israelites.

According to the Mischna, the oldest part of the Talmud, and which was revised toward the end of the second century of our era, the flesh of animals whose viscera showed perforations or morbid loss of substance, was not to be consumed as food. In those portions of the work which appeared at a later period, mention is made of vegetations (tubercular neoplasms) of the viscera, and particularly of the lungs; and with regard to the last-named organs, whether the air blown into them did or did not penetrate these vegetations, also determined whether the flesh of the animal should or should not be allowed for food.

Hai Gaon, who died in 1038, states that the small vegetations (*Kandi*) are vesicular, and the larger ones (*Tinari*) are like stones (cretified phthisical nodosities).

* Leviticus, chapter xxii., verse 8; see also *Franck*, "Système d'une Police Médicale Compléte." Vol. iii., Mannheim, 1783.

† Only Jewish butchers could apply this mark.

The early Christians had, up to the third century, maintained without modification the laws of Moses with regard to food. At a later period, when the Jew-Christians, as they were called, had disappeared, these grand laws were not so scrupulously observed; nevertheless, the bishops still sat in their respective dioceses every year as judges of morality, and conformably with the prescriptions of the Old Testament, they inquired whether the flesh or blood of hunted or torn animals had been consumed as food.

Schmidt mentions the morality jurisdiction assemblies, in his "History of the Germans."*

When panzoötic diseases (Cattle Plague and Anthrax) manifested themselves in the course of the ninth century, the Franks had published to them the laws of the Church, which interdicted the consumption of the flesh of diseased animals, and, among others, that of cattle and pigs affected with Leprosy—a term which, at that time, was synonymous with Tuberculosis and Cysticercus Cellulosus. The continuation of the Roman manners and customs which preceded the Christian civilisation, may have been partly the cause of the retention of the alimentary laws. At Rome, as is well known, the superintendence of the sale of food was entrusted to four market inspectors called ædiles, who, among others, had the power to order all bad or putrid flesh to be thrown into the Tiber.

In Italy, France, and Spain, as well as in South Germany and in the region of the Danube, where Roman civilisation and manners were introduced, we also find the institution of a more or less severe *surveillance* of the trade in meat. It is mentioned, for instance, in Krunitz' "Encyclopædia of the Economic Sciences," that in Spanish towns the cattle-dealers were always, up to the end of the last century, obliged to bring their animals to the slaughter-house at a certain hour, and after slaughter the carcases of these were examined by a physician or surgeon detailed for this duty. If the flesh was found to be diseased, without any other form of procedure it was taken outside the city and buried. The inspection was gratuitous for the butcher and cattle-dealer.

At Paris, on January 30th, 1350, it was ordained that the

* Part i., p. 582.

butchers would only be permitted to sell healthy meat, and that they must conform to the law in this matter; and by a Parliamentary decree dated March 29th, 1551, butchers were rigorously prohibited, under pain of corporeal punishment, to sell, or attempt to sell, unhealthy or corrupt flesh; and they had to submit their animals to inspection by a functionary delegated with ample powers.

An ordinance of Wurtemburg, dated 1558, and the "Statuta Heinrich-Stadiensia," prescribe "that every day good flesh shall be sold by the butchers; that this flesh must not be coriaceous (*wolfbeissig*), nor from an animal suffering from Osteomalacia (*beinbrüchig*); that it be not infected with worms (*wurmig*) or maggots (*madig*), nor attacked with tubercular nor measle nodules (*finnig*); that it should be without fault or vice (*preishaftig*); that flesh not free from any of the lesions enumerated must not be mixed with healthy flesh; and that the latter must be kept separate from the former, so that it be not soiled thereby."

During and after the Thirty Years' War, bovine Tuberculosis was probably widely spread and attracted much attention; and at that time, by a fortuitous incident, it became still more interesting. This incident is thus described by Dr. Ammon:*— "In 1677, twelve students who had taken their repast in the convictorium of Leipzig, died. At the inquest it was proved that the hotel-keeper had given them, in addition to other food of a bad description, the flesh of emaciated and infected cows, whose viscera were covered with a great number of *vesicles*, of tubercular nodules (*Finnen*), and of purulent tumours. Externally, this flesh did not offer any abnormal appearance."

As a consequence of this fact, there arose different opinions as to the nature of tubercular Phthisis, and the danger of using the flesh of animals affected with this disease. Public feeling was greatly stirred by the unfortunate accident, and, exaggerating its proportions, it demanded severe protective measures.

In France, tubercular Phthisis was supposed to have some relationship to Leprosy, but in Germany it was imagined that it might be due to habits of sodomy, and that it was of a syphilitic nature. In both countries, rigorous measures were

* "Dissertation Générale sur les Matières Alimentaires." Berlin, 1775, p. 275.

adopted against the sale of the flesh of animals affected with the disease. For example, by an Act of Parliament of Paris, dated May 28th, 1716, Antoine Dubou, overseer of the Field Slaughter-houses, was condemned to make an apology in his shirt, bare head, and naked knees, a rope round his neck, a lighted wax taper weighing two pounds in his hands, and a large placard on his back and another on his chest, on which was painted: "Overseer of the butchers, who has issued to the soldiers leprous flesh from animals killed because of the disease, and who has wickedly sold and distributed the flesh of unsound cattle." Being found guilty of fraud and other crimes, he was, in addition, condemned to nine years' banishment, and for ever deprived of the privileges of a butcher, as well as made to pay a fine of five thousand pounds, one-fifth of which went to the prosecutors. A similar punishment for the same offence, was awarded in the same locality on December 11th, 1716.*

According to Graumann,† a short time after the catastrophe at Leipzig, in 1680, severe measures were enacted in Germany for the prevention of the sale of the flesh of tuberculous cattle. In consequence of these evidently excessive measures, butchers dare not have anything to do with the carcases of cattle which showed the least trace of the disease. Such carcases, and even the pole-axe which had been used to slaughter the cattle, were handed over to the public executioner.

Towards the middle of the last century, these draconic measures, which weighed so heavily on the breeder and feeder, began to be protested against. It was also reported that the executioners (*Scharfrichter*) did not bury diseased carcases, but consumed them in their own families, or sold them to third persons, without any injury or inconvenience; and it was pointed out that there was not so much severity in the butchers' share of the confiscation, inasmuch as he could recover his pole-axe by paying a fine of a thaler.

* *Tscheulin:* "Thierärztliche Polizei," 1821, p. 56.
† "Franzosenkrankheit," 1784.

(*To be continued.*)

Editorial.

RABIES.

THE recent researches of Pasteur and his colleagues, MM. Chamberland and Roux, into the nature and prevention of Rabies, are full of interest and great importance, and should the results obtained be confirmed and amplified by other observers, then there can be no doubt that a most important step will have been made in medicine, and especially in that branch of it which deals with the prevention of and protection from communicable disorders.

We have, from time to time, reviewed the work already done in this direction, and some time ago, in an article contributed to the *Nineteenth Century*, have insisted most urgently on the immense importance of the prospect opened out by the inoculation of modified or cultivated virus, as a means of affording immunity against the invasion of very serious diseases, when passed into the bodies of yet unaffected animals. It is true that we are as yet scarcely beyond the threshold of investigation into the subject, but what has already been accomplished is great, and has nearly revolutionised our views with regard to these maladies in particular, so far as their etiology and prevention are concerned.

In a paper read before the Academy of Medicine last May, Pasteur and his colleagues distinctly advance our knowledge of Rabies, and present the disease to us in something of a new light, with a strong practical tendency in addition. It is pointed out that if Rabies is transmitted from the diseased dog to the monkey, and ultimately from monkey to monkey, that at each transmission the virus attenuated in virulence; and when so attenuated, if it is passed again to the dog, or to rabbits or guinea-pigs, it remains attenuated, never returning to the virulence it possessed in the rabid street-dog. This modification can easily be brought about by passing the virus from monkey to monkey a few times, until it will no longer produce the disease in dogs by hypodermic inoculations. Even inoculation by trepanning the cranium, which is so infallible in conveying Rabies, will produce no result, and the dog, nevertheless, will be protected, and no longer capable of receiving the disease.

But, on the contrary, the rabific virus is exalted in intensity when it is passed from rabbit to rabbit, or guinea-pig to guinea-pig; and when so exalted to its maximum intensity in these creatures, it will pass in the same energetic form to the dog, and show itself much more active than that of the ordinary rabid dog. So heightened is its virulence in these conditions, that when inoculated into healthy dogs, it constantly produces the fatal disease. Although the potency of the virus is exalted in its transmission from rabbit to rabbit, or from guinea-pig to guinea-pig, it requires several transmissions through the bodies of these animals before it regains its state of maximum virulence, when it has been previously enfeebled by passing through the monkey. In the same way the virulence of the ordinary rabid dog, the virus which has not nearly

its maximum intensity, requires, when it is conveyed to the rabbit, to be passed several times through creatures of this species before it reaches its maximum.

The application of these results of experimentation, is to allow of dogs been readily rendered refractory to Rabies. For instance : Rabific virus is obtained from a rabbit which has died after inoculation by trepanation, and after a longer period of incubation by some days than the shortest period in these animals, which is invariably between seven and eight days subsequent to inoculation by trepanation with the most active virus. The virus of the rabbit, at its long incubation, is inoculated by trepanation into a second rabbit; the virus of this to a third; and at each time, these viruses, which become more and more potent, are inoculated into a dog. The latter at last becomes capable of supporting what would be to other dogs a deadly virus, and is entirely proof against Rabies, either by intravenous inoculation, by trepanation, or by the virus of the rabid street-dog.

By inoculations with the blood of rabid animals, in certain determinate conditions, Pasteur has been able to greatly simplify the operations of inoculation, and to render dogs most decidedly refractory to the malady. There is great importance attached to the suggestion, that now, and until Rabies has been extinguished altogether by inoculation, it may be possible to prevent the development of the disease after bites from rabid dogs, owing to the duration of the incubative period. Experiments have been made in this direction, and with most marked success, under the observation of Beclard, Dean of the Faculty of Medicine; Paul Bert, Professor of Physiology; Bouley, Professor of Comparative Pathology at the Museum of Natural History; Villemin, Professor of Medicine; Vulpian, Professor of Comparative and Experimental Pathology; and Tisserand, Minister of Agriculture. Fifty-nine dogs have been experimented upon, nineteen of them rabid, and thirty-eight bitten by them under uniform conditions. Of these, thirty-eight had been previously protectively inoculated, the other half not. The latter, without a single exception, died with unmistakable signs of Rabies; whereas the nineteen others are yet unaffected. They will be kept under close observation for a year, to ascertain whether the protective inoculation is permanent, or only temporary in its effects. Pasteur maintains that Rabies is produced solely by the bite of rabid animals; and if this be correct, and his inoculation afford protection, it is suggested that a law compelling all dogs to be so protected, would in the end extirpate the disease entirely, whereas if it arises spontaneously such an enactment would be less effectual.

However this may be, we will look forward with the keenest anxiety to the results which will follow the experiments now being conducted, fraught as they are with immense importance to mankind and animals.

It may be noted that Gibier has ascertained, experimentally, that birds contract the disease by inoculation through trepanation, but recover spontaneously from it

RECENT STUDIES IN BACTERIAL PATHOLOGY.

THE firmness of the hold which Bacteria, and all that relates to them, have taken on the mind of scientific investigators, says *The Lancet*, may be accurately measured by the number and length of the contributions to periodical medical literature. A grand discovery, like a huge wave, is invariably followed by a succession of smaller undulations of varying size, which are of value in their own way. If complete reliance may be placed on the conclusions of M. Pasteur's recent work on Rabies, we may indeed congratulate scientific vivisection on having achieved a position which not only conclusively establishes its *raison d'être*, but ought surely to silence the unreasonable demands of the anti-vivisection movement.

The first communication to which we draw attention is one by Osol, on the virus of Charbon, a disease which, though perhaps almost worked out, still continues to attract a large share of attention. Under the guidance of Professor Semmer, of the Veterinary School of Dorpat, Osol has studied the influence which the injection of charbon blood, deprived of its spores and bacilli by boiling, has on the animal organism. Blood taken from large-sized animals dead of charbon was first diluted with equal parts of water, boiled in glass vessels, and filtered while hot. The residue of the filtration and the coagulum formed by boiling were again treated with water, and once more boiled and filtered. After this double filtration the liquid was heated on three consecutive days for a period of two hours each time. Large injections were then made on rabbits and mice, with properly cleaned syringes. Other animals used as control subjects were inoculated with minute quantities of the charbon virus. Some sterilised broth was also inoculated with some of the reduced virus, kept in an incubating stove. Finally, the blood of the sheep and horse, taken from healthy animals, was subjected to the same manipulations as the charbon blood, and then injected in the same doses as the latter into mice and rabbits. Animals inoculated with the charbon virus previously boiled have perished in from three to six days. Their blood and glandular organs, examined immediately after death, contained in a quarter of the number of cases the bacilli characteristic of Splenic Fever. In those instances where bacilli were not detected, innumerable micrococci, like those described by MM. Semmer and Bollinger in 1872, were found. According to these observers, the rods and cocci represent two complementary morphological elements. M. Osul never came across the protococci recently described by M. Archangelski ("Contribution à l'Etude du Contage Charbonneux," Dorpat, 1884). Inoculations with the blood from animals dead of the induced disease on sterilised culture liquids led to the development of typical forms of bacillus anthracis. The same blood syringed under the skin of rabbits and mice led to the death of this second batch, bacilli being also discovered in the blood and viscera. The control animals experimented on with minute doses of the poison exhibited no pathological manifestations. The sterilised liquids remained perfectly clear, thus proving that the boiled virus contained no living organisms. From these investigations, M. Osol concludes that there exists in the blood of animals affected with charbon a specific virus, soluble in water, but non-volatile and of a chemical nature. When this virus is inoculated on animals, it modifies their liquids in such a manner that *indifferent* micro-organisms contained in the normal tissues are transformed under the influence of the virus into charbon bacilli at the end of from three to six days. M. Osol does not underrate the importance of the bacilli, which he regards as the only agents capable of producing the specific chemical poison.

M. Zahn has made fresh researches on the blood of rabbits, cats, sheep, and calves (Virchow's *Archiv*, p. 401, 1884), tending to prove that the blood of

healthy animals does not contain the germs of putrefaction. He collected, with full precautions, small quantities of blood in tubes previously filled with hydrogen, oxygen, and carbonic acid, so as to exclude the atmospheric air. After weeks and months the contents of the hermetically sealed tubes, kept at a constant temperature of 37-38° C., remained free from any sign of putrefaction.

M. Hauser (*Centralblatt für die Med. Wissensch.*, No. 21, 1884) has searched for micro-organisms in living healthy tissues. Entire organs and parts of tissues, removed, by means of instruments previously heated, from animals just killed, were at once placed in super-heated glass vessels, the mouths of which were securely plugged with cotton-wool. These vessels were then kept in a moist chamber at a temperature of about 30° C. The conclusions arrived by Hauser were to the effect that micro-organisms do not exist in healthy tissues. The bearing of Zahn's and Hauser's experiments on those of M. Osol are plain, since the last-named believes that healthy tissues do harbour germs.

Beltzow (*Centralblatt für die Med. Wissensch.*, No. 21, 1884) has examined five cases of pyæmia and one of pyosepticæmia, with a view to clearing up the nature of the germs associated with these diseases. He has found that the organs of human subjects dead of pyæmia contain, besides colonies of cocci, a considerable number of bacilli, which belong to two distinct morphological varieties. One of these has a distinct resemblance to the bacilli of malignant œdema, and the others have dimensions intermediate between the bacilli of Tuberculosis and the bacilli of the septicæmia of mice. In one case only, by the side of the cocci and bacilli, in the liver, colonies of leptothrix buccalis were discovered blocking the capillaries of the gland.

Baumgarten has given the following method for the pure cultivation of the bacilli of tubercle :—A tubercular nodule rich in bacilli, removed with due antiseptic precautions from a living animal or human cadaver, is transplanted into the anterior chamber of a rabbit's eye ; as is well known, under these circumstances, no inflammation follows. The transplanted nodule perceptibly augments in volume, and is allowed to do so for from eight to fourteen days. Microscopical examination shows that the increase in size is due chiefly to the germination of bacilli, and, at the same time, that the histological elements have undergone corresponding atrophy. If portions of this premier nodule be inserted into the anterior chamber of the eye of another rabbit, and so on for a series of rabbits, a time comes when an absolute pure culture of tubercular bacilli is obtained. The successive inoculations required by this procedure set up specific inflammatory lesions of the eye, followed by generalised Tuberculosis.

Falk has observed that putrefaction destroys the virulence of the tubercular virus. He has endeavoured to obtain by experimental means a benign Tuberculosis by inoculating virus attenuated by putrefaction, at the same time hoping to discover a means of "vaccinating" against Tuberculosis. Inoculation on rabbits with putrefying tubercular lesions was followed by a local tubercular mischief only, which ended either by suppuration or calcification, no internal lesions being discovered. But it was found that animals thus experimented on derived no immunity from fresh inoculations made with pure tubercle ; indeed, Tuberculosis seemed to ensue more rapidly.

Baumgarten has fed rabbits with milk in which tubercle bacilli had been held in suspension. After a single meal of from fifty to forty grammes of this milk, the rabbits presented, with a remarkable constancy, tubercular infiltrations of the mucous coat of the intestine, mesenteric glands, and liver. The more charged the milk was with bacilli, the more extensive was the resulting lesions. In some of these latter cases the vermiform appendix and large intestine were eaten through with caseous ulcers, on the edge of

which tubercles with epithelioid cells stuffed with Koch's bacilli were to be found. At the surface of the tonsils there also existed, in some cases, ulcerated lesions infiltrated with bacilli. Baumgarten believes that infection takes place at the upper end of the digestive track. Of other organs in these instances the lungs only exhibited tubercular lesions. This observer has also remarked that putrefaction lessens the virulence of the tubercular material.

FITZWYGRAM PRIZES.

THERE were seven competitors for these prizes at the last competition. The written part of the examination was held in London and Edinburgh on the 13th ult., and the practical and *vivâ voce* on the 7th inst., at Manchester, Mr. T. Hopkin, F.R.C.V.S., kindly granting the use of his establishment.

The following is the result and the number of marks obtained by each competitor, and annexed is the questions :—

NO.	WRITTEN.	PRACTICAL.	TOTAL MARKS.
15	861	630	1491
18	808	755	1563
9	808	690	1498
6	746	590	1336
4	711	625	1336
3	655	Insufficient number of marks.	
10	509	Disqualified for the practical portion of the examination.	

Result.—No. 18. .. Mr. J. E. Rickards .. 1st Prize, £50 { Both from the
„ 9. .. Mr. E. Taylor .. .. 2nd „ £30 { London School.
„ 15. .. Mr. A. J. Haslam .. 3rd „ £20 { New Vet. Coll., Edinburgh.

The examiners appointed were Mr. J. J. Meyrick, C.B., and Mr. T. Hopkin. Mr. A. W. Hill was superintendent and honorary secretary.

The following were the questions submitted :—

Anatomy.

1. Describe the courses of the metacarpal and plantar nerves, giving their relative positions with regard to the arteries, veins, tendons, and ligaments near which they pass.

2. Name the ligaments which hold together the various bones forming the stifle joint.

3. What do you cut through in the operation of castration? Describe the relative positions of the blood-vessels and the vas deferens in the part where the cord is severed.

4. Enumerate all the muscles used in the act of breathing, and state which nerves control their movements.

5. Give the origin, distribution, and functions of the 5th pair of cranial nerves.

6. Give the muscles of the larynx, and state which are affected in roaring. Describe the class of horse most subject to this affection.

7. What purpose do the valves in veins serve? In which are they most abundant, in which are they absent, and in what tissues do veins originate direct from arteries without the intervention of capillaries?

Pathology.

1. What are the causes, predisposing and exciting, of Specific Ophthalmia? Describe the changes which it produces in the structure of the eye, and state what you consider to be the best treatment.

2. Mention in detail the difference between the symptoms of Glanders and those of Nasal Gleet. How would you fix upon the exact spots for trephining, when treating the latter disease?

3. Describe the causes of Quittor, the terminations when improperly treated, and the most certain method of curing it quickly.

4. What are the symptoms during life, and the *post-mortem* appearances of Rinderpest? Describe the measures you would adopt in order to prevent it from spreading.

5. In what class of injuries are poultices or hot fomentations highly injurious, and how would you treat such injuries?

6. Describe the symptoms of a case of Rabies in the horse.

7. Describe the symptoms (underlining the pathognomonic), treatment, and terminations of a case of Pleurisy in the horse.

8. What diseases are demonstrated as being due to *micro-organisms* in the horse, cow, sheep, and pig? Give a brief description of these organisms as seen under the microscope.

Physiology.

1. Describe the difference between the circulation in the fœtus of a mammal, and in the same animal some weeks after birth.

2. Describe the minute structure of the kidneys, and name the various substances carried out of the system in the urine.

3. Detail the chief differences between the horse and ox, in the anatomical formation of their stomachs and intestines. State what is the most generally received theory of the process of rumination.

4. Describe the cilia lining the mucous membrane of the air-passages, and state what their use is believed to be.

5. Describe the structure of the liver, the composition of its secretion, and the portal circulation.

6. How is the liquor amnii secreted, and of what use is it?

7. Describe the structure of serous and mucous membranes. State what are the principal secreting membranes in the horse.

THE FELLOWSHIP DEGREE OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

An examination for this degree was held on the 23rd June, when four candidates presented themselves, of whom Messrs. W. A. Edgar, of Dartford, R. Moore, A.D.V., and R. C. Trigger, Newcastle, Staffs, passed a successful examination.

Dr. Geo. Fleming, F.R.C.V.S., Messrs. Cox and Duguid, F.R.C.V.S., and E. Pinches, B.A., were the examiners.

The following questions formed the written portion of the examination :—

Comparative Anatomy and Physiology.

1. Describe the characters of the class Mammalia; name the Orders to which our different domestic animals belong, and give a brief outline of the characters of each Order.

2. What are the chief differences seen in the skeleton of birds as compared with mammals?

3. What is meant by the term nutrition as applied to animals? State the various functions included under that general head.

4. What is the normal temperature of our different domestic animals, and state how that temperature is maintained.

Therapeutics.

1. What is the therapeutic action of purgative medicines? State the circumstances under which their administration is indicated.
2. What is the therapeutic action of Opium? State what advantages may be gained by the subcutaneous injection of Morphia, instead of the administration of opium by the mouth.

Pathology.

1. What is the pathology of Parturient Apoplexy and Puerperal Fever?
2. What is the pathology of "Broken-Wind," and what conditions or circumstances give rise to it?
3. What are the differences between Cow-pox, Horse-pox, and Sheep-pox?

Epizootiology.

1. On what influences does the spread of Rabies depend, and what should be the measures adopted for limiting its extension?
2. Under what conditions is Glanders likely to become epizootic?

Surgery.

1. Describe the operation of Trephining:
   (*a*) The several situations on the horse's head which are available for the operation.
   (*b*) The diseased conditions which may render it advisable.
   (*c*) The method of performing it.
2. Describe Tenotomy to correct congenital deformity of the fore-leg, connected with shortening of the *flexor perforans* tendon, also describe the subsequent process of repair and elongation of the tendon.

Dietetics.

1. Give directions on suitable feeding for a foal from six weeks old, on being deprived of its dam.
2. Give a description of "Ergot," and state the effects produced on animals by food which is affected by it.

Sanitary Science.

1. Give a plan for disinfecting a stable in which there has been a case of Glanders.
2. What diseases in horses are most commonly met with after confinement in ill-drained and ill-ventilated stables?

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

At the meetings of the Court of Examiners of the R.C.V.S., held on the 4th and 5th July, the following students from the Royal Veterinary College were admitted members of the profession:—

Mr. H. M. Singleton...	London, N.
„ T. E. Baker	Crewkerne.
„ Henry Smith	Oxford.
„ Wm. Brookes	Pilkington, near Manchester.
„ H. C. Wilkie	Holloway.
„ R. Butler	Caledonian Road, N.

Mr. J. E. Rickards	... ...	Paddington.
„ George Stear	... ...	Ashburton, Devon.
„ A. V. Field	... ...	Huddersfield.
„ John Brett	... ...	Woodhouse, Notts.
„ J. D. Arnfield	... ...	Bury, Lancs.

The following students passed their "Second Examination" on the 7th, 8th, and 9th July, 1884 :—

Mr. J. S. Channon.
„ W. A. Collins.
„ H. B. Chambers.
„ *J. C. Coleman.
„ T. B. Arnald.
„ *G. H. Pickwell.
Mr. G. Boulton.
„ G. S. Arkcoll.
„ C. Griffith.
„ F. Eassie.
„ *G. H. Gibbings.
„ G. Goodliff.

The following students passed their "First Examination" on the 10th 11th, 12th, and 14th July, 1884 :—

Mr. G. F. Brown.
„ H. T. Reynolds.
„ J. A. Sudren.
„ *C. Cardozo.
„ †T. V. Pettifer.
„ ‡W. T. Wilson.
„ *A. Peele.
„ W. A. Dellagana.
„ †E. A. West.
„ C. A. Lye.
„ R. A. Philp.
„ *T. H. Hobson.
„ W. Rattee.
„ ‡G. P. Bond.
†Mr. W. M. Reeman.
„ T. E. W. Lewis.
„ *J. D. Roberts.
„ C. E. D. Dayns.
„ T. N. Clarke.
„ *C. H. T. Bray.
„ ‡F. Warren.
„ J. R. Bathen.
„ C. E. Williamson.
„ G. Hurford.
„ *H. M. Carter.
„ J. R. Welsby.
„ *F. J. Carey.
„ W. Stevenson.

* Marked thus passed with Credit.
† Marked thus passed with Great Credit.
‡ Marked thus passed with Very Great Credit.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Special Meeting of Council, held June 18th, 1884.

Mr. J. D. Barford, Vice-President, in the chair.

Present :—Professors Robertson, Brown, Duguid ; Messrs. Dray, Greaves, Cartwright, Cox, Wragg, Perrins, Whittle, Blakeway, and the Secretary.

The Secretary read the notice convening the meeting.

The minutes of the last meeting were confirmed.

Letters were announced as having been received from Prof. Walley (President), Dr. Fleming, Mr. Santy, Mr. Reynolds, and Mr. Taylor, regretting their inability to attend the meeting ; and from Prof. Walley, Mr. Walters, Mr. Borthwick, Mr. Cartwright, and Mr. Walter, acknowledging the honour of their election.

Presentations to Council.

A statuette of Prof. Dick, presented by Dr. Fleming.
Journal de Médecine Vétérinaire et de Zoötechnie.

Cinerators and Sanitation, Hints on Disease of Cattle in India, presented by Mr. J. Mills.

Annual Report of the Agricultural Department of the Privy Council Office, and Statistical Tables relating to Home and Foreign Animals, presented by Prof. Brown.

On the motion of Mr. DRAY, seconded by Mr. WRAGG, a vote of thanks was passed to the respective donors.

A letter was announced from Prof. Robertson, asking that the examinations might take place either on the 3rd or 4th proximo.

The SECRETARY stated the result of the Fitzwygram Prizes Examination : Mr. J. Rickards (Royal Vet. Coll.), 1st prize of £50 ; Mr. E. Taylor (Royal Vet. Coll.), 2nd prize, £30 ; and Mr. A. J. Haslam (New Vet. Coll., Edin.), 3rd prize, £20.

A letter was announced from the Home Secretary, thanking the Council for their letter of sympathy with the Queen on the death of the Duke of Albany.

A letter from a member of the profession, exposing a case of fraud, was referred to the Registration Committee.

A letter was read from Mr. R. H. Dyer, of Limerick, stating that a practitioner had been fined or imprisoned for docking an animal, and asking if the Council would take the matter up.

The SECRETARY was directed to acknowledge the receipt of the letter, and state that the Council did not at present feel justified in interfering with the operation of the law.

The Reports from the Court of Examiners were then read.

The following Committees were appointed :

The Parliamentary Committee.

The President, Professors Brown, Robertson, Pritchard ; Sir F. Fitzwygram ; Dr. Fleming ; Messrs. Cartledge, Greaves, Harpley, Walters, Simcocks, Simpson, Barford.

The Museum Committee.

The President, Prof. Pritchard, Prof. Axe, and Mr. Dray.

The Finance Committee.

Messrs. Cartwright, Cox, Dray, Greaves, Harpley, Taylor, Walters, Wragg, and Dr. Fleming.

The House Committee.

Professors Pritchard and Robertson ; Messrs. Cox, Greaves, Harpley, Simpson, Walters, Wragg, Whittle, and Dr. Fleming.

The Registration Committee.

Professors Pritchard and Robertson ; Messrs. Cartwright, Dray, Greaves, Walters, Wragg, Whittle, and Dr. Fleming.

The Library Committee.

Professors Axe and Robertson ; Messrs. Blakeway, Harpley, and Dr. Fleming.

The Examination Committee.

The President, Sir. F. Fitzwygram, Professor Pritchard ; Messrs. Harpley, Woods, Dr. Fleming, and the Principals of the different schools.

The By-Laws Committee.

The President, Sir F. Fitzwygram, Professors Pritchard, Robertson, Williams, McCall; Messrs. Cartledge, Cox, Greaves, Harpley, Simpson, Wragg, and Dr. Fleming.

The Dinner Committee.

Professor Pritchard; Messrs. Simpson and Wragg.

Examiner in Chemistry.

Mr. DRAY proposed the appointment of Mr. Stevens as Examiner in Chemistry, in the place of Dr. Voëlcker.

Mr. COX seconded the motion. Mr. Stevens, he said, had already acted *pro tem.* as Examiner. He had the advantage of being an examined member of the Pharmaceutical Society, as well as being a member of the Royal College of Veterinary Surgeons.

The SECRETARY read a letter from Mr. Stevens.

After some discussion, in which opinions were expressed in favour of appointing a member of the College, it was decided that Professor Voëlcker's son be requested to conduct the next examination, and that the election of a permanent Examiner should be postponed till the next quarterly meeting of the Council, notice to be given in the circular calling the meeting.

On the motion of Mr. DRAY, seconded by Mr. WHITTLE, it was agreed: "That £3,000 from the General Account of this College, and £2,000 from the College Fund Account, be placed to Deposit Account."

Mr. DRAY moved that the Secretary's salary should be increased by £50 in order that he might obtain assistance whenever he thought proper, such assistance to be paid for out of this sum. He stated that under the sanction of the President and Council the Secretary obtained assistance last year at a cost of between £40 and £50, and the previous year at a cost of £50.

Mr. COX seconded the motion.

Mr. GREAVES thought the question should be postponed until the quarterly meeting.

Professor BROWN, whilst cordially approving of the resolution, also recommended that it should be postponed till the next quarterly meeting.

The resolution was carried.

SECOND SPECIAL MEETING.

Another special meeting was then held to take into consideration the advisability of holding the next quarterly meeting at Manchester.

Mr. GREAVES, on behalf of Mr. Simcocks, proposed that the next quarterly meeting should be held at Manchester. This was an exceptional year. On the 30th and 31st July a great meeting of the National Veterinary Association would be held in that city, and it was the wish of many members of the Council that the next quarterly meeting should be held there. He was quite aware that the Charter specified that the meetings should be held in London, Westminster, or the suburbs, but he had understood it that also gave the Council power to fix the place of meeting.

Mr. WHITTLE seconded the motion, though he also was afraid that it was contrary to the Charter.

The motion was ultimately withdrawn, it being the general view that the Council had no power to meet out of London.

The meeting terminated with a vote of thanks to the Chairman (Mr. Barford, V.P.).

College Builaing.

The Council afterwards inspected a site in Bloomsbury Square, thought suitable for a college building.

The Secretary was instructed to obtain further particulars.

CENTRAL AND SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATIONS.

ON June 25th a meeting of the Central and also the Southern Counties Veterinary Medical Associations was held at the Town Hall at Windsor. The President, Mr. Wragg, took the chair, and there were present, Messrs. Hollingham (Hon. Sec.), of Red Hill, H. J. Hancock, A. Broad, C. Sheather; Professor Pritchard; J. Rowe, F. G. Sampson, J. B. Martin, — Barford, H. L. Simpson, and other gentlemen, whose names, unfortunately, were not obtained. Lord Arthur Somerset also honoured the meeting by attending.

Mr. HOLLINGHAM read a telegram from Dr. Fleming, regretting his inability to attend, through War Office business; he also read several letters and telegrams from other members, regretting their inability through business engagements to attend the meeting.

The minutes of the last meeting were then read by the SECRETARY, and confirmed.

The PRESIDENT then intimated that as the time at disposal was limited, and Mr. Simpson had been good enough to obtain an order to inspect the Royal farms, he would not detain them longer than to thank them very heartily for the honour they had done him in re-electing him President for the second year. He need not assure them that it would be his endeavour to further the best interests both of that Association and the profession.

The President then introduced

Professor PRITCHARD, who proceeded to give a most lucid and scientific lecture, containing many new ideas concerning "Curb in the Horse." He said: I shall endeavour to show that what has hitherto been taught and written thereon is somewhat incorrect; firstly, by drawing your attention to the anatomical structures involved in the disease. I shall not speak of extraordinary or complicated cases, but of "Curb" pure and simple. Curb is an enlargement of the lower part of the back of the hock, and always in the central line; this should be borne in mind, in order to avoid mistakes in the examination of hocks. The hock is made up of a number of small bones, above which are the large thigh-bones, and below the three metatarsi; those to which I wish to draw your attention are the "cuboid" and the "calcis." The ligaments of the hock are so complete, that, as an example of this, take the cuneiform bones from a horse's hock, and you will find you cannot separate the ligaments without breaking one of the bones. The one I would specially allude to is of great strength, running from the calcis to the cuboid; another ligament is the one which passes round the back of the tendons of the hock, and is called the posterior annular ligament; and passing over the bend of the hock and down the back of the limb is a tendon which we call the flexor pedis perforatus, which is held in its position and prevented from moving laterally by this annular ligament. Between this tendon and ligament we have a double layer of synovial membrane, which allows the tendon free movement. This is all the anatomy that I intend to draw your attention to.

Professor Pritchard then pointed out that the calcano-cuboid ligament was of such great strength that no action on the part of the horse would be likely to sprain it, and bring about such a condition as would result in Curb. He also said that after examining hundreds of cases, he had never seen this ligament in a state of disease.

Professor Spooner also taught that a Curb was due to a sprain of the annular ligament; this condition he (Professor Pritchard) had never seen. I also believe that you will see in print that it is due to a sprained condition of the perforatus tendon; but in the *post-mortem* inspection-room you will not find disease of this tendon at this particular part, with the exception of

flocculi of lymph on the outer side, and I cannot understand why it should become sprained here, although it may become sprained between the hock and the fetlock. There are other theories, among which may be classed disease of the cuboid. It would, however, be waste of time to attempt to refute them. I will now tell you to what I think Curb is due. I have told you that this annular ligament, under which is the synovial sheath, allows of the movement of the perforatus tendon a certain distance, and supposing a horse, in making a great leap, or a false step in travelling along a road, moved this synovial sheath a sixteenth of an inch beyond what is usual, then inflammation takes place, lymph is exuded, and that exudation produces Curb; and I think it is worth considering whether other diseases of horses' legs, which we term sprains, may not proceed from the same cause.

Professor Pritchard, after alluding to various kinds of treatment, said he had found nothing equal to the firing-iron, used in the form of the thermo-cautery.

Mr. SHEATHER: I should like to ask if there is any position in which the hock may get where Curb is more likely to be produced than in another.

Professor PRITCHARD: I do not think that there is. Under my theory the same effect would be produced whether the sprain was upwards or downwards.

Mr. SIMPSON: I must say that the theory that we have not a sprained tendon is somewhat startling. I do not know whether Professor Pritchard's theories would hold good in the case of the suspensory ligament, but I presume that the old ideas would stand here. I should like to know whether Professor Pritchard has ever given particular attention to an enlargement which occurs below the hock, and above the seat of Curb.

Mr. BARFORD said: I think the greatest compliment we can pay Professor Pritchard is to discuss the subject of his address. I have always thought that Curb is due, in a great degree, to a fluid deposition under the annular ligament in order to facilitate the friction in the action of the limb. I do not think we have laceration of fibres or anything else, but that the fluid deposited becomes organised in time, causing the bulged appearance. I also think that when we have a deposition of bone by the side of the seat of Curb, we should be extremely careful in diagnosing. Speaking of a severe case of "breakdown," I have always thought that the fibres of the tendon have been violently put to the stretch. I think Professor Pritchard's treatment is good; a remedy I have employed with success is ʒj of corrosive sublimate to ℥j of spirits of wine. This remedy ought to be used only by a professional man.

Mr. SHEATHER: I have been very pleased at this opportunity of hearing a lecture from Professor Pritchard on this subject. I had accepted what has been taught in our text-books as the true pathology of Curb. In one case which I examined after death, that of an animal which had suffered from Curb, I found a gelatinous, blood-coloured matter, scarcely set, which we should scarcely expect from a sprain of a large ligament. I have seen horses go back to work in three days after being lame with Curb, without any treatment at all, and they have never had a recurrence of the attack. How could this be, if the position of the os calcis depended upon this ligament keeping in its place? As to sprains of the posterior annular ligament, I am almost certain that what Professor Pritchard says is correct. I think that ligaments are sprained seldomer than is generally supposed. As regards treatment, that mentioned by Professor Pritchard is no doubt the best. I have used the instrument he mentions, and I find that you get the best effect without blemishing the animal to any degree. All methods which favour absorption seem to be the right ones to use at first. Mr. Barford has mentioned corrosive sublimate. This should be used with caution. I think that the strength as mentioned by Mr. Barford is quite enough. I should like to ask the question whether there is any one position in which the hock may be placed in which

Curb is more likely to be produced than another. I think that the sudden reining back of a horse is more likely to produce a Curb than the reverse action of the extension of the tendon. Mr. Sheather then mentioned a case where he had every reason to believe that Curb was formed by a horse landing from a leap.

Mr. SIMPSON alluded to the enlargement sometimes found at the heel of a horse after the operation of neurotomy, which, he thought, might be due to the laceration of the synovial membrane in the heel, and Professor Pritchard's theory would support this. He also quite agreed with Professor Pritchard as to the advantages of the thermo-cautery over the ordinary iron.

Mr. MARTIN thought that Professor Pritchard's opinion would do good by leading to further investigation. Having had, as he said, opportunities of examining hundreds of cases of Curb, Professor Pritchard was in a good position to judge ; but as horses are generally worked for years with Curbs, veterinary surgeons are not able to obtain the requisite anatomical knowledge. He believed Curbs are, to a great extent, hereditary. Mr. Martin then alluded to cases which had come under his notice in support of this opinion.

Mr. SAMPSON : I think that Curbs are probably due to an increase in the quantity of the synovial fluid, as we have many cases that do not produce lameness, which would be the case if a tendon was sprained.

Lord ARTHUR SOMERSET said : I have had a good deal of practical experience with Curbs, and have found that fomentations until the heat has been taken out of the Curb, and then application of equal parts of spirits of wine and spirits of ammonia to be very effectual, without any other treatment.

Mr. WRAGG : I was taught by Professor Spooner that Curb was due to sprain of the annular ligament, and since then I have not taken the trouble to investigate the disease much. Professor Pritchard's theory is quite new to me, and I think I may adopt it. I should like to hear something said about the kind of hocks most predisposed to Curb. I think we are much indebted to Professor Pritchard for giving us such an able address.

Mr. SHEATHER : I have principally had experience with half-bred horses, and have not paid much attention to the kind of hock most liable to Curb. A horse with a sickle hock, or a short os calcis, would, however, be likely to have Curb.

Mr. HOLLINGHAM : My experience in this matter has, perhaps, been more limited than that of many other gentlemen present ; but the majority of cases that have come under my notice have been in what we should call good-shaped hocks, perhaps because they have been subjected to more exertion. Where time has been a great object I have succeeded in removing Curb lameness by applying cold water with a pipe two or three times a day, for about a quarter of an hour each time ; if the lameness recurs I have then, without loss of time, had recourse to other and more severe measures.

Professor PRITCHARD : The sprained condition of the tendon, and the enlargement above the seat of Curb, immediately under the cap of the hock, alluded to by Mr. Simpson, is due to a dropsical condition of the bursa. In reply to Mr. Barford, as to the fluid thrown out causing the bulge, I am rather inclined to differ from him. I think that in a *post-mortem* examination you would find blood mixed with lymph thrown out into the sheath. It becomes organic, and if you could examine the same Curb three months afterwards you would find a partially solid mass. I have noticed that however much a horse recovers from Curb he never regains his beautiful inflexion of the hock. With reference to Mr. Barford's remarks as to the use of corrosive sublimate, I have known it bring about recovery. I agree with Mr. Sheather that a Curb occurs more frequently from extreme flexion of the hock

than from extreme extension. Any movement of the horse which stretches the synovial sheath beyond its limits will produce Curb. As to Curbs being hereditary, this is an old bone of contention. I do not believe Curb is hereditary, though the form of the limb may be so. A Curb in a well-shaped hock is not the rule. Lord Arthur Somerset has alluded to a simple line of treatment which he has found efficacious. If the veterinary surgeon were to adhere to this method, his patients would scarcely recover quickly enough to satisfy his clients.

Mr. SHEATHER then proposed a vote of thanks to Professor Pritchard for his kindness in coming so far to enlighten them.

Mr. SAMPSON seconded, and the motion was unanimously carried.

Professor PRITCHARD, in reply, said: I thank you very much for so kindly recognising my efforts to add a little to the knowledge of the veterinary surgeon. If I have only awakened in your minds something which will lead to further investigation, I shall think that I am amply repaid.

A vote of thanks was then, on the motion of Mr. BARFORD, seconded by Mr. SIMPSON, unanimously accorded to the Chairman.

Mr. WRAGG having briefly acknowledged the compliment,

Mr. BARFORD said: As a member of the Southern Counties Association, I am sure I may say that we all appreciate the honour conferred upon us by Lord Arthur Somerset, in coming among us to listen to a discussion in connection with the horse; especially when we consider that the noble Lord is a member of one of the best sporting families in this country, and that he has taken the deepest interest in the welfare of the profession to which we belong.

Lord ARTHUR SOMERSET said: I had no idea when I came to this meeting that any mention would be made of my name; I merely came to listen to the lecture. It will always be a matter of the highest interest to me to do what I can to further the interests of the veterinary profession.

The members then, through the kindness of Mr. Simpson, who obtained the requisite order, were enabled to visit her Majesty's Model Farms on the Windsor estate, and after spending a pleasant afternoon, dined together at the Castle Hotel. E. A. HOLLINGHAM, *Hon. Sec.*

THE BORDER COUNTIES VETERINARY MEDICAL SOCIETY

A MEETING of the above society was held on the 6th of June at the Bush Hotel, Carlisle, the President, Mr. Carlisle, in the chair.

The following members were present: Messrs. Joseph Carlisle, Carlisle; H. Thompson, Aspatria; J. M. Watson, Ireby; J. Pears, Penrith; R. Roberts, Kendal; W. C. Crowdace, Haltwhistle; Wm. Summers, Allendale; John F. Thompson, Aspatria; Jas. G. Bell, Carlisle; Jacob Dawson, Carlisle; Thomas Coates, Brampton; J. Lawson, Keswick; J. Young, Cockermouth; J. Soulsby, Whitehaven; J. Donald, Wigton.

The visitors included Professors Williams and Lewis, Edinburgh; Mr. J. Twentyman, Blenerhasset Farm; Mr. Pattinson Hayton, Carlisle; and Mr. Warwick, Hutton Ends.

The CHAIRMAN opened the proceedings by calling upon the Secretary to read the minutes of the preceding meeting.

Mr. JAS. G. BELL nominated Mr. Howe, Keswick; and Mr. THOMPSON nominated Mr. John Bell, Clonmel, as members of the Society.

The SECRETARY next read letters of apology for non-attendance from the following gentlemen:—Messrs. A. J. Mc.Intosh, Dumfries; R. Rutherford, Edinburgh; Jacob Howe, Keswick; Thomas Greaves, Manchester; T. D. Anderson, Wigton; Henry Pears, Langholm; James Clough, Whitehaven;

James Chalmers, Longtown; Joseph Robson, Penrith, and Professor Walley, Edinburgh.

On the motion of Mr. THOMPSON, Aspatria, Professors Williams and Lewis were elected honorary members of the Society.

The SECRETARY stated that he had received the following notice of motion from Mr. Dawson :—"That it is desirable that the representatives of the lay press be excluded from our meetings, and that all reports thereof emanate from the Secretary direct."

The SECRETARY called attention to the fact that Mr. Christopher Chambers, near Silloth, had been suing for attendance in the Wigton County Court. Mr. Chambers was not a veterinary surgeon, and it would be well that he should be informed that his acting as one was subject to a penalty. He believed the case had been submitted to arbitration. It was agreed that Mr. Chambers be cautioned.

The SECRETARY advised members to see that their names were correctly entered in the register of veterinary surgeons, pointing out one or two omissions.

Mr. THOMPSON proceeded to read his paper on

"*Hoose and Diarrhœa in Stirks, prefaced by some remarks on Foot-and-mouth Disease, and Germic Diseases in general.*"

Some twenty-four years ago, on my first settling down at Aspatria, I remember being on one occasion in the farm-yard at Brayton Hall, when the late Sir Wilfrid Lawson entered into conversation with me, in the course of which he alluded to my recent commencement of practice. He expressed his good wishes for my success, adding that he thought there was plenty of room for a professional man in the district.

During the interview he referred to the large number of deaths annually taking place amongst his young cattle, and urged me to look around and endeavour to introduce some rational measures as preventatives, in the way of better sanitary arrangements, which would tend to save the lives of the young animals, and as near as I can remember he said :—

"If this could be accomplished by any system of improved sanitation, it would be a great boon to the whole farming community, as I consider the saving of the lives of the young animals somewhat analogous to the old adage in connection with saving money, 'Take care of the pence and the pounds will take care of themselves,' and so it would be in farming stock, if farmers took care of the calves and stirks, the older animals might be allowed to take care of themselves."

He also alluded to the numerous losses arising from calves dying from what is commonly called "White Scour" or "Diarrhœa," enlarged joints, or what is still vulgarly named "Joint Fellon," also from inflammation of the umbilical cord, or that which is known as "Navel-ill," as well as Hoose or cough. The remarks made by the late baronet I have never forgotten; they were the first which led me to think of preventive measures for some of the diseases in cattle, and especially their young, over which we have very little control with medical treatment, as we are generally consulted when too late, but, by giving attention to the prevention of the maladies, I do most decidedly think that we, as veterinary surgeons, would raise the status of the profession considerably above what it has ever yet attained.

It is an old but true saying that "Prevention is better than cure," and if we could by any means devise methods whereby we could prevent some of the maladies which make such ravages and cause such heavy losses in our valuable flocks and herds, how much better would it be than endeavouring to cure them after the disease has been allowed to develop itself.

In my opinion, a large number of the complaints to which cattle are subject would be considerably reduced, if the breeders and feeders would turn

their attention to a better system of farm sanitation, and I feel certain if sanitary measures were enforced, our annual losses would not be nearly so heavy as they are at present. Look at the appalling loss yearly sustained by Rot or Liver-Fluke, Braxy and Louping-ill, in sheep alone, ailments indigenous to our country, and which might be prevented it the Government would look to and take up energetic measures, in the same manner as they do at present with what they happily call "foreign or imported diseases." If, with the help of men like Drs. Burdon Sanderson, Bastian, Professors Tyndall, Pasteur, Koch, and others, who have devoted their time and talents to the discovery of germic diseases—diseases which are due to small organisms in the system ; if we could demonstrate as a certainty that Foot-and-Mouth disease, lately so prevalent, was due to small germic bodies in the blood ; if we could also discover under what peculiar circumstances and conditions these organisms take up their abode in the animals and multiply and produce the disease, and by these means be enabled to prevent it, how much better it would be than to have to suffer from the unpleasant, unsatisfactory, and expensive regulations which cause such a dead-lock to the cattle trade of this country. In former years, when there were no restrictions, and the disease was allowed to have its full swing, immediately it made its appearance, it was not unusual to have all the cattle brought in contact with each other, so that the disease might the sooner run its course, which it invariably did, and died out in a considerably shorter space of time than it appears to do at the present day.

Generally speaking, epidemics and epizootics are more virulent at their first outbreak than in their later stages, proving beyond doubt that the morbid material, germs, or spores, which cause the disease to become modified or attenuated and lose their extreme virulence, by passing through the bodies of so many different animals, and gradually assume a milder form until the diseases disappear. If this were not so, every severe epidemic would have a tendency towards total extermination. Relaxed systems with feeble vitality, and weak constitutions with fine organization, are the subjects most suited for the development and multiplication of micro-organisms, and, from accounts, Pasteur has by repeated propagations or generations succeeded in so modifying the bacilli of several fatal diseases, that they not only become quite harmless, but also act as a preventative by inoculating healthy animals with these attenuated preparations.

Formerly, when the disease was rife, very little was thought about it, and veterinary aid was scarcely ever required ; and why there should be such a commotion in the country when it happens to break out now, I am utterly at a loss to understand, seeing that very few deaths take place. From the general tone of the country over which I travel, both amongst farmers, cattle-dealers, and others, there is but one opinion on the subject, and that is that the restrictions as to the removal of animals have done more injury and caused more loss, in a commercial point of view, than ever the disease did in its most virulent form. Whenever I have asked farmers, traders, and feeders, if they could buy store cattle affected with Foot-and-mouth Disease at 10s. or 20s. per head less than non-affected animals, would they run the risk? all have replied that they would risk the transaction as they had done before when there were no restrictions. What did the restrictions do for the cattle and sheep-feeders last winter? Why, they caused stocks to be purchased at such high figures, that when they were ready for the butcher, after wintering on cake, corn, turnips, etc., the animals failed to bring the prices paid for them at the previous back end ; who has to recompense the farmer for this loss? Must he look to the Government or landlord? Where do his rent and taxes come from when he is losing on both horn and corn? As the finest dressed wheat is now making only about half the price it did a few years ago, it is quite certain that the real practical men, who are the meat-producers, are not at all

in favour of these rigid restrictions ; we, therefore, can only assume that they must have their origin and enforcement with fancy breeders, who can afford to give £500 to £1000 for a single animal.

Certainly, it causes in many instances a great pecuniary loss to individuals, when in-calf cows are attacked, resulting in casting their calves, loss of milk, and death of the young animals ; but this, in my opinion, can be modified or prevented to a great extent. Sheep also suffer very much from this disease, and so do young pigs. But individuals must, and have had always, to give way to the majority.

The origin of this disease sometimes appears veiled in mystery. I remember, some years ago, a friend of mine, Mr. George Tordiff, Wolsty-Stangs, bought some cattle from a neighbouring farmer. A few months after Foot-and-mouth Disease broke out in his farm buildings, and all the animals, cattle, sheep, and pigs, etc., were affected more or less with the complaint. Strange as it may appear, Mr. Tordiff had not bought a single animal from any other person between the time of purchasing these animals from his neighbour and the commencement of the complaint ; and what is more striking still, there was not, to my knowledge, another case of Foot-and-mouth Disease in either Cumberland or Westmoreland at that time ; nor had any of his friends or neighbours a single case, and the disease died out on the premises without spreading any further. Yet at this time there were none of the stringent regulations as to the removal of cattle, nor yet a cordon of police to guard the infected area. Again, a few months afterwards, a black cow commenced with a disease of the left lung which ended in Pleuro-pneumonia, and Mr. Tordiff unfortunately had to slaughter the largest portion of his valuable stock. One of the cows at the time of attack was suckling two calves, the cow was put down, but the calves lived and did well, never showing the least symptoms of the disease. No other outbreaks followed these on Mr. Tordiff's farm, though I attended the animals through both diseases twice and three times a week, and passed to and fro amongst other stock without any serious consequences arising therefrom.

Mr. Thomas Watson, of Hayton, informs me that when he lived at Ireby, he bought a cow from one of his neighbours ; two months after it commenced with Foot-and-mouth Disease, and all his stock suffered more or less, with the exception of twelve bullocks in a byre adjoining the box, and only separated by a thin partition from the cow that first commenced. Nor had he purchased any other animal in the interval ; the disease extended no further, nor was there any other case Mr. Watson was aware of in the county. Again, some time ago, Hy. Railton, Esq., Snittlegart, bought about a score of cattle at Cockermouth market, which had been exhibited at Carlisle two days previously, and no doubt but they would have been inspected there. Two of his friends looked at the animals before Mr. Railton purchased them ; they were then sent home and driven along a road through two parcels of land occupied by some of his neighbours, wherein cattle and sheep were grazing ; next day the recently purchased animals were found to be suffering from Foot-and-mouth Disease, but it confined itself to these animals, and spread no further, neither did any of the animals depasturing in the fields through which the cattle had passed the previous day become infected, nor did four cows suffer that were following on the road from Cockermouth immediately behind Mr. Railton's cattle.

Again, the last time the complaint attacked the cattle at Brayton Hall, there were nearly 200 head in the parks. The object in bringing them all together was to let all take the disease as soon as possible, and to get through it, when only about ninety-eight animals became affected. This, to my mind, proves pretty clearly that the germs become modified or attenuated by passing through so many different subjects, and thereby lose their virulence,

which goes to prove, to a great extent, the experiments of Pasteur, as he has succeeded in developing from a vegetable spore or germ, by cultivating hay tea bacilli in animal soups, and generating it into the malignant germ of Anthrax, which destroys so many sheep on the Continent. After passing through the bodies of living animals, he has recultivated the germ, so as to rob it of its virulent action, thus showing that from these small vegetable organisms, which are floating in our midst unperceived by the naked eye, under certain conditions and circumstances, are undergoing continual change, and some ever ready for attacking the animal kingdom with epizootic and epidemic diseases whenever a favourable opportunity and a suitable subject offers itself, and again to become modified or attenuated by passing through the bodies of a number of living subjects. This is well exemplified in every-day life. We all know that by careful cultivation we can develop from the wild oat grass a perfect oat, while, on the other hand, a perfectly-developed oat, if left to its natural resources and uncared for, will degenerate back again to the common oat grass. The same law holds good for the parsnip and every other vegetable; and so we find it in the animal kingdom, or why change our male animals? for we know too well that in-and-in breeding tends to degeneracy and disease. Then why there should be such a cry out immediately a case of Foot-and-mouth Disease is reported, and such stringent official restrictions and red-tapeism enforced, I cannot tell—making a great fuss over the symptoms, but leaving the cause to have its effect; and if by the restrictions so rigidly enforced we keep Foot-and-mouth Disease lingering in our midst, preventing it from running its course and dying out, we do a great injustice to private individuals, as well as to the whole community.

Whenever we have a case of Cholera, Typhoid Fever, or Scarlatina in the human subject, it can generally be traced to some defective drainage or bad sanitary arrangement; but these subjects are now well under the control of the medical profession, and not left to conjecture, or in the hands of unscientific men, and it is very humiliating to veterinary surgeons to have these matters taken almost out of their hands, and only allowed to play second fiddle.

I am inclined to think, that in many instances these so-called imported diseases are mainly due to the exhaustive effects of the means used in the transmission of cattle from other countries to this one. For instance, take Ireland. Cattle may have to be driven a number of miles before being placed on the railway, to be carried a long distance, more particularly in the early spring months, and, perhaps, have just left their warm byres or cabins, and, therefore, are quite unprepared for a long, cold journey. They are then put on ship-board, closely huddled together, and on reaching our shores after, perhaps, a rough passage, they are again retrucked, and sent onwards, and arriving at some market town, are exposed for sale; the purchasers then take them forward, perhaps another ten or thirty miles by rail or road, and all this while with little or no food. Having arrived at their fixed destination, the owner, for fear they should be affected with disease, has them housed into, perhaps, a damp, badly-ventilated place, or turned into the open field, and probably all this is being done during the most inclement weather. Is it, then, any wonder that the systems of the animals become so relaxed and enfeebled as to present the most favourable conditions for the development of these epizootic diseases? and as it is now generally thought these maladies are in a great meaure due to small germs developing and propagating in the body, for it is a well-known fact that the air we breathe is teeming with germs of life, as well as the water we drink, which only require suitable circumstances and conditions, where they can find a bed and proper pabulum for their development, I therefore think there is ample room for further research, and the introduction of preventative measures.

At every port of debarkation in this country there ought to be provided large quarantine depôts, where the animals, on their arrival, could be properly sheltered and attended to until the relaxation and exhaustion, brought about by the sea voyage, had passed away, and as soon as they had attained sufficient tone of system, they could be allowed to proceed on their journey. The regulations of the depôt should be under Government rule, and properly qualified attendants to look after them, and see that the animals were well-cared for, the expenses entailed by these arrangements to be defrayed by the importers. These regulations would, I think, greatly tend to minimise the so-called "foreign diseases" arising from cattle being imported into this country, and the seller would gain more per head for the animals, which would cover the cost, and the purchaser would buy with greater confidence.

But, Mr. President, I think I am transgressing. At the last, and I might say, the first meeting of our Society, I promised to read a paper on "Hoose and Diarrhœa in young cattle," and as these two complaints arise from somewhat similar causes, I have therefore coupled them together.

With reference to the former complaint, it should be understood that I allude to the Hoose which is so common amongst young cattle at the back end of the year, and which, you are all aware, is caused by the presence of small thread-worms, known as strongles, infesting the trachea or wind-pipe, and bronchial tubes, generally most prevalent in September and October, more particularly so in wet seasons, on strong clays or retentive soils, where water is seen in small pools ; in fact, on any land that is soppy and wet. Such conditions always favour the complaint. There seems to be a great difference of opinion as to how the worms in such large numbers as are found on *post mortems*, gain their habitat. My friend, Mr. A. S. Moffat, of Newcastle, an eminent microscopist, informs me that while examining a strongle, taken from the lungs of a sheep, under a single microscope, he was not a little surprised to see the posterior half of the body split open longitudinally, and a large number of young—in every way the fac-simile of the parent—roll out into the water on the slide. They all seemed fully formed and ready for their work, thus showing that the parasite is ovoviviparous, hatching its young within its own body, and not depositing eggs. This, I think, accounts for the large number of the parasites being found so early after the commencement of the complaint in the trachea and bronchial tubes ; but how they gain their admittance at first, as already stated, I am at a loss to understand. I trust, however, that from the discussion which I expect to follow, with the microscopic illustrations by Professor Williams, we may arrive at a satisfactory conclusion as to how they do so.

My view is that the small strongles, which have been hatched in the bronchial tubes, might have been coughed up by previously affected animals on to the grazing pastures, or left on the ground in the fæces of such animals, and in wet weather or dewy nights—as they require moisture for their existence—attach themselves to the muzzles of the calves, and insidiously find their way up the nostril into the trachea, their proper habitat, whilst the calves are in a sleepy condition, induced by the sedative effects of the cold ground, when lying down at night with their head and neck outstretched, as we frequently see them.

These parasites, after becoming fully matured, split open and liberate numerous smaller worms, which have been developed within their body ; and thus, two or three strongles are quite sufficient to account for the large number frequently found in the wind-pipe. Be this as it may, my practical experience has always pointed to this fact, that—

CALVES AFFECTED WITH THIS COMPLAINT are those which have been

turned out to grass and left out over night, more particularly in wet autumn weather. I have also found an occasional case, where the animals have been turned out during the day and brought in at night; but the generality of the cases are amongst animals left out in the field all night, or till a late hour after the sun has gone down. Where the young animals are kept in-doors, and never turned out to graze until they are a year old, they are seldom or never affected with this troublesome pest; therefore the preventive measures are very simple indeed. It is only necessary to keep them indoors till they are twelve months old, and have them well supplied with plain good food and dry beds. As for the symptoms and treatment, I think it would be superfluous for me to deal with this, as this paper is intended to treat more with the prevention than with the cure of disease; however, I have been fairly successful in treating the complaint with a balsamic terebinthian preparation, combined with good nursing and judicious feeding. I may also state, in passing, that I could quote numerous instances, not only in my own district, but in many other parts of the country, where the affection which was very prevalent, has been entirely eradicated by dressing the land with crushed rock-salt in the early spring months, at the rate of from 5 cwts. to 6 cwts. per acre, even when the young animals have been turned out during the day, and left out till a late hour at night.

I may here mention, that during the past summer I had a number of cases of Hoose in grown-up cattle, where the symptoms were in every way characteristic of Pleuro-pneumonia, and on auscultation of the lungs of several of the affected animals there was heard the well-known sound, as in the second stage of Pleuro. I attributed the cause to the herbage, which contained a large quantity of what is known as white-topped grass, or "*Agrostis vulgaris*," common or brown bent grass, a worthless species, and which I have on former occasions had every reason to believe was is some way connected with the very troublesome coughs in cattle during August and September; and I am inclined to think that some small insect deposits its eggs on this grass, which irritates the respiratory organs of the cattle feeding thereon, for on removing them to a fresh and better pasturage, the coughs have always disappeared. I now come to the most important part of my paper,—

DIARRHŒA, a subject which our friend, Mr. Harrison, auctioneer, of Carlisle, introduced at our last meeting, by asking if anything could be done in the way of preventing so many young stirks suffering from Scour, as during the last few months he had seen more young animals affected with this complaint than he had ever remembered during the whole of his experience.

This disease has been the bane of the veterinary profession for years. By its ravages, hundreds of young animals are annually destroyed, and from reports, it has been more rife during the last winter than for many years, and I attribute this increase of the malady to the large rainfall we have had of late.

Diarrhœa may arise from various causes, but I shall confine my remarks principally to that which attacks young stirks ranging from six months to two years of age. I remember, when I first commenced practice at Aspatria, the disease was very prevalent in the surrounding district. For five successive years, the whole of the young stock on the Allerby Hall estate succumbed to the complaint—during the three years previous, and the two years following my settling in Aspatria. Every imaginable kind of treatment was tried, but without effect. In the *post-mortems*, I invariably found the biliary ducts of the liver completely filled with fluke-worms, the liver disorganised, and the gall-bladder enlarged. I also observed at the time, that young animals which were kept indoors, and not turned out to graze, never suffered from the disease. This, so far, was something gained. The next point was what was the cause of the complaint? and how did the fluke-worm get into the liver?

Seeing that Professor Thomas, of the Oxford University, has lately conducted an extensive and exhaustive investigation of the natural history of the Fluke-worm—the great cause of Rot in sheep, and in the majority of cases of Diarrhœa or Scour in young cattle—with which, I presume, you will all be more or less conversant, it will be quite unnecessary for me to enter into the habits and nature of this little pest.

First, then, as to the cause of the disease. Various theories have been advanced. Some attribute it to the parents, as a hereditary disease; but that cannot really be the cause, as we frequently see the parents living, and in apparently good health, long after their progeny have been carried off by this scourge. Others say it arises from irritation of the bowels; and in many cases this is correct, the irritation being due to some foreign body lodged in and causing irritability of the lining membrane of the intestines, the effects of which are soon seen.

Again, animals from two or three years of age suffer from Diarrhœa, owing to the irritation set up in the mucous membrane of the alimentary canal, by the shells of the milk teeth not having been cast at the proper time. But when these are removed, the animal generally does well. By others, the disease has been attributed to the presence of small strongles, which have been picked up and become embedded in the mucous membrane of the intestines, when the animals have been at grass during the latter part of summer. But in all my *post-mortems* I have never been able to find the disease to arise from this cause. Then, again, we have it arising from the derangement of the liver, and this from two different and totally distinct causes. First, from the presence of the fluke-worm, as already referred to, which develop themselves in the bile-ducts of the liver, and second, from the complete structural change of the liver into what is known as fatty degeneration. By the aid of the microscope you will have ocular demonstration of the sound structure the liver ought to present in its healthy condition, and also of the changes which it undergoes in the process of fatty degeneration. As already stated, the disease is most prevalent amongst young animals that have been turned out to grass before they are a year old, more especially about the harvest months. In the early part of summer, when the grass is fresh and succulent, the calves are usually kept indoors, and have a good supply of milk; but as the season advances, when the grasses are getting rough, seedy, woody, and dry, and when insect pests are depositing their eggs for winter shelter, the supply of milk scarce, and the young animals requiring more food, the farmers are busy with their harvest operations, and are tempted to turn their fine, young, healthy-looking calves into the pastures, and by these means they come into contact with the germs, which, in time, give rise to the presence of flukes in the bile-ducts. As August and September are the two most fatal months, both for sheep and cattle taking into their systems the pupæ of the liver-fluke, and which is now generally thought to be secreted in the stalk, and under the cuticle or skin of the stems of grasses, growing in damp and soppy situations. This I have found to be the principal cause of so many young stirks suffering from this baneful malady, and as a preventative, I have recommended all young calves to be kept indoors until they were twelve months old, and the pastures dressed with 6 to 10 cwt. of rough crushed rock-salt to the acre in spring, and wherever the advice has been acted upon, the disease has almost entirely disappeared. I have only seen an occasional case in my district during the last sixteen years.

But I am sorry to say that since I promised to read this paper, I have seen several cases at two different places—one, a lot of six stirks, two of which recovered and four died, and on *post-mortem* examination, the bile-ducts of the livers were found to contain large quantities of flukes. The

cause was attributed to the young animals having grazed the previous summer on some strong, wet land. The second, a lot of eight fine young shorthorn heifers, one, two, and three years old, the symptoms resembling those animals affected with flukes ; but on careful *post-mortems* and microscopic examinations, the disease proved to be due to fatty degeneration of the liver, and portions of such livers are now under the microscope on the table for your observation, and perplexing me in no small measure to find the cause. I knew the animals had been well cared for, having a good supply of the most nutritive feeding materials in the shape of cake and corn, but during summer they had also been turned out to graze, which I thought was quite sufficient to account for the excessive Diarrhœa, although the land was dry, sound, and good, on which they had been pasturing. All were doing well, and in first class condition till between Martinmas and Christmas, when their coats were noticed to lose their fine healthy bloom, and clapped close to the skin, which was tight on the ribs ; the sides became flattened, appetite lost, body pinched and wasted with excessive Diarrhœa. On my visiting them, I was very much astonished to find them scouring. Knowing how they were well fed and attended to, I felt confident the animals had accidentally got into some unsound land and contracted the fluke, but this idea was strongly opposed by the owner. On the death of the second animal a different state of things was revealed from that we find when the animals die from the presence of flukes in the liver, for instead of the pale, emaciated body, both of flesh and fat, this one contained large quantities of fat on the inside of the belly, intestines, and ribs. The kidneys were also well covered, but the liver was of a peculiar light brick colour ; very small and rounded at the edges, and so brittle that, on lifting it up, it could not support its own weight. The gall bladder was enlarged and thickened, and the muscles or flesh in a wasted condition.

Naturally this caused me no small amount of anxiety as to what could be the cause of this peculiar change in the structure of the liver of such young animals as only the heifers, which, as already stated, were of the fine shorthorn breed, were affected thus, while the bullocks of the same age and under the same premises and system of feeding were not affected.

A short time before the complaint showed itself the animals had a change of food, in the shape of a compound cake which contained a very large percentage of fat-forming matters, about 65 per cent., such as starch, sugars, etc., while the albuminoids, or flesh-formers, were very low, only about 12 per cent. ; and it is quite possible that the superabundance of fat-forming materials might be taken up by the lacteals and carried by the portal system direct to the liver, and thereby have something to do in setting up the change in the structure of that organ, as the animals were in great condition prior to the compound food being given to them ; however, our friend, Professor Williams, will favour us with his views on the subject with a microscopic demonstration of the structural change into fatty degeneration.

I am not prepared to say that this peculiar change in the liver is a very common cause of this troublesome and generally fatal diarrhœa, nor yet am I prepared to say it is not so. Although numerous opportunities are offered for making *post-mortems*, we too seldom avail ourselves of them to ascertain the facts, and it is quite possible that when young calves are well cared for in the early part of their lives, and then turned out to graze, the acid elements of the grasses may act in a somewhat similar manner as do the elements of the starch and sugar, seeing that all of them are compounds of C, H, and O, and thus set up a kind of fermentive process, and bring about the change. It is a fact, however, that whether the disease arises from fluke or fatty degeneration, the great cause is due to the animals being put out to pasture at the latter part of summer, and this is well confirmed by the appearance

of those that are kept indoors; for not only are they free from both Hoose and Diarrhœa, but in spring, when offered for sale, they are in a better condition, and bring considerably higher prices to the breeder than those poor, ill-conditioned-looking animals that have been turned out the previous autumn. And, as already stated, I therefore recommend that all young stirks be kept in loose or airy courts till they are twelve months old, and the grazing pastures to be dressed with rough crushed rock-salt in the spring months.

The noticeable difference in the symptoms of the two diseases I have observed are that the Fluke cases generally commence with a tickling cough, followed by diarrhœa, with an irregular appetite, great thirst, and the animals generally linger on till their bodies are completely wasted before death closes the scene. In fatty degeneration we have no cough, no appetite, great thirst, rapid emaciation, excessive diarrhœa; the fæces has a peculiar sickly smell, and the animals generally die very suddenly.

As the treatment of both Hoose and Diarrhœa when fully developed is so very unsatisfactory, our attention should be given to the best means of prevention, not of these complaints alone, but also that of the numerous affections which carry off so many young calves in their early life, more particularly White Scour, which has been so prevalent this recent spring, and if we could by any means assist the breeders and feeders in manipulating their feeding materials, draw attention to sanitary measures, such as drainage and ventilation, and thereby save the lives of the young cattle and prevent the drain on the national wealth of the country, such as exists in the present day in the purchase of so much live and dead meat—money going out of the country which might be kept in—we should be looked upon as a scientific body, and worthy of the name of a profession. But these matters need further inquiry, and we have both good men and true in our ranks who are able and willing to investigate these questions. It is impossible for any single individual to devote the time and money necessary for experiments without State aid, and being of national interest, they should be supported and placed under Government auspices, and on a somewhat similar basis to that which they work on the Continent; but I am sorry to say the ruling power of this country is too slow to perceive some of its national wants.

On the conclusion of Mr. Thompson's paper,

Professor WILLIAMS said the paper was a masterly one, but he could not admit that Mr. Thompson was right in all his conclusions respecting Foot-and-mouth Disease. But he could not go into that question, because he was to do so elsewhere. Young sheep and calves put on to a pasture in the back end, on which old sheep had grazed the preceding summer, were almost sure to become affected with Hoose. The ova were taken into the stomach with the leaves of aquatic plants, growing by the side of stagnant water, and passed into the circulation, and so found their habitat in the lung tissue, which in time develop and liberate as many as 300 small worms from one parent. Speaking of fatty degeneration of the liver, he said there were four ways in which fat may accumulate in the tissues pathologically to constitute disease. First of all when there was too much fat or fat-forming material in the food; when the blood does not contain sufficient oxygen to oxidise the fat, as, for instance, in cases where animals have too little exercise; when the fat liberated from the nitrogenous food during nutrition was not oxidised; and when the fat formed during the breaking up of the protoplasm during nutrition was not oxidised, and so remained in the cell, and he had no doubt whatever but fatty degeneration of the liver, in many instances, was the cause of fatal Diarrhœa in both cattle and sheep. He had also seen troublesome and serious Diarrhœa arising from strongles in the fourth stomach. Singly, they could not be seen by the naked eye, but on close observation the fluid in the stomach could be seen to move, which, on microscopic examination, re-

vealed myriads of strongles. In concluding his remarks, he reminded them that cattle were ruminating animals, a fact which was sometimes lost sight of, but which should be always kept in view when selecting their food. Nature intended the animal to chew the cud, and eat rough food; and people who pampered their animals in early life would reap the penalty always inflicted on those who were impertinent enough to abuse nature's laws. (Applause.)

Professor WILLIAMS then submitted a number of microscopic sections, which were examined by the meeting with great interest, showing two good specimens of fatty degeneration of the livers sent to him by Mr. Thompson, from subjects named in his paper, one slide of amyloid liver, a beautiful section of lung tissue, showing strongles coiled upon themselves, and a section of actinomykosis, etc., etc. The Professor further remarked upon the great and growing good the formation of these societies had upon the profession, and urged all to prepare and read a paper on some subject, and, above all, to make a more extended use of the microscope, for he could assure them that he had the greatest of pleasure in searching into the hidden mysteries of nature. Another thing he wished to bring before them was, the National Veterinary Medical Association, which would meet in August, this year, at Manchester, he believed; but he thought that before the Society could be of much service to the profession, it would have to print its own matter, and in order to do that. he urged all to join the movement.

Mr. DAWSON said he was a believer in the germ theory of disease, and he was of Mr. Thompson's opinion as to the working of the Contagious Diseases (Animals) Act. Policemen talked of the first and second and third stages of Foot-and-mouth Disease, while veterinary surgeons stood back; and it was high time that the horse was put before the cart, and that the present topsy-turvy state of things should be put an end to. He believed the cattle restrictions had been in a sense a failure.

Mr. ROBERTS, speaking of Foot-and-mouth Disease, thought half-a-mile radius was sufficient for the purpose of isolation. (Hear, hear.) He did not think the disease was indigenous to this country, and he believed by careful police regulations the thing might be entirely stamped out and kept out, if it was only prevented from being re-introduced from foreign countries. He was in favour of isolation to a certain extent, but certainly not to the preposterous extent which the country had recently had to experience. (Cheers.)

Mr. PEARS having made a few remarks complimenting Mr. Thompson upon his paper, Mr. WATSON followed, re-echoing some of the views expressed in the paper.

Mr. COATES said he believed they would never be able to do much with Foot-and-mouth Disease until they had found out the cause of it. He did not think that restrictions did very much good. When a case occurred he would let it take its course.

The CHAIRMAN: Let every tub stand on its own bottom. (Laughter.)

Mr. COATES: Yes.

The CHAIRMAN recalled the time when Foot-and-mouth Disease broke out in this country. A cure resorted to was large fires lighted from tinder kindled by beating iron until it became red hot. This went under the name of "*need fire*," and was carried from place to place by a man on horseback, at full gallop. The cattle were put amongst the smoke and then taken home. (Laughter.)

Professor LEWIS said he listened with pleasure to Mr. Thompson's paper. Mr. Thompson seemed to think that Foot-and-mouth Disease might spring up spontaneously; he did not agree with that; and he was surprised the other day to see that the Privy Council were taking up somewhat of the same view, holding that continued outbreaks were not so much due to foreign importation

as to circumstances existing in the country. (Hear, hear.) Up to the present it had not been satisfactorily proved that the micro-organisms found in the excretions of animals affected with Foot-and-mouth Disease were the cause of the disease. Many seemed inclined to question whether a greater loss would be caused by the disease being allowed to take its course than by carrying out the restrictions. The disease was a mild one and seldom proved fatal. If it was a practical fact that the disease did not cost so much to the country as the carrying out of the regulations, then the question rose whether the restrictions ought to be put on ; but if it was a question of getting rid of the disease, then undoubtedly restrictions must be carried out with great strictness, as each case of Foot-and-mouth Disease acted as a centre from which the contagion spread. It was a little ridiculous to use policemen for inspecting instead of veterinary surgeons ; and he had known cases where Foot-and-mouth Disease remained on farms long after the premises had been declared free.

Professor WILLIAMS said he was of the same opinion as Dr. Crichton, that a disease may originate *de novo* and become a contagious disease under certain circumstances. He was of opinion that Foot-and-mouth Disease can be suppressed. It came from abroad first, and he denied the assertion of Dr. Lyon Playfair that Foot-and-mouth Disease had become indigenous to this country. The Contagious Diseases Act had been carried out properly in Scotland, where the Local Authority was composed of magistrates and tenant farmers, and they had suppressed the disease. In Scotland, also, the policeman was kept in his place, and he had done his duty well and to the satisfaction of the inspector. In England they carried out the Act in a different way. They had a shoemaker or some individual of that kind connected with the village or town who was looked upon as a big magnate, and he laid down the law ; but in Scotland, where the Local Authority was composed of men who knew the subject, they were able to cope with the disease. He maintained that the disease was due to contagion and contagion simply. The law was hard in this way. There were so many petty authorities in the first place. If the disease was to break out in one byre in this county the whole county would be scheduled by neighbouring counties. The thing was ridiculous nonsense, which any one of common sense would admit. (Loud cheers.) Half a mile circuit was quite sufficient. (Cheers.)

Mr. SOULSBY was also of opinion that half-a-mile circle was sufficient, and Mr. DONALD said the way in which the Act was carried out in Cumberland and Westmoreland was such that the cure was worse than the disease. (Cheers.)

After some remarks from Mr. Watson and Mr. Lawson,

Mr. THOMPSON replied, and said he thought his remarks on Foot-and-mouth Disease favoured the germ theory, in which he was a great believer. With respect to the restrictions, it was very remarkable that so much attention was paid to the welfare of horses and cattle, and so little to human beings, and he could only think of one reason for this, which reminded him of a Cumberland story related by the late Wm. Dickinson, of Thorncroft, where a "Jack-of-all-trades" took up doctoring both "man and beast," and one of his neighbours told him "to mind and only doctor fooak (folk)." "What for?" demanded the would-be doctor. "Why for this," said his friend, "thou sees beasts costs brass (money)." And he thought this was confirmed when the Prince of Wales, in proposing a vote of condolence to the relatives of the late Mr. Booth, said that Mr. Booth had been one of the principal movers in the Contagious Cattle Diseases Bill—Mr. Booth having lost in one year thirty-two of his valuable short-horn animals from Foot-and-mouth Disease, which was very remarkable, as the complaint was very rarely fatal amongst ordinary stock, and was, in his opinion, due to the constitutions of the animals having

become weakened by the purity of their blood, thus rendering them more susceptible to the disease; and he thought it would be much better for landowners and farmers to turn their attention more to farm sanitation, and have silos erected, cause all rough grasses on old-laid grazing pastures to be mown in the autumn and made into ensilage, which would have many beneficial results. It would not only destroy the winter shelter of some of the insect pests, but would secure a good, wholesome food for the young animals, so that they could be kept indoors, and thus be prevented from contracting either Hoose or Diarrhœa.

The CHAIRMAN said that a great deal of matter in Mr. Thompson's paper had not been touched, and he proposed that it be brought forward at next meeting for further discussion, which was agreed to.

Complimentary votes of thanks were given to Mr. Thompson for his paper, to Professors Williams and Lewis for their attendance, and to the Chairman for presiding, the proceedings terminating at about five o'clock, having lasted three hours. J. DONALD, *Secretary.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the Blackfriars Hotel, on June 11th, 1884.

Present:—Peter Taylor, Esq., President, in the chair; and with him Professor Williams, also Messrs. Thos. Greaves, Wm. Whittle, E. Faulkner, J. W. T. Moore, J. S. Hurndall, Thos. Briggs, S. Locke, T. Hopkin, A. W. Briggs, W. A. Taylor, Jno. Lawson, A. M. Michaelis, J. W. Ingram, E. Kitchen, W. H. Bridge, Wm. Woods, R. S. Reynolds, and J. B. Wolstenholme, members; also visitors—Messrs. Roughsedge, Delacherois, and Jones.

The minutes of the last meeting were read and confirmed.

Letters of excuse were received from Professor Walley, and Messrs. Wm. Dacre, A. Darwell, H. Thompson, G. Morgan, C. Phillips, and William Leather.

The Secretary read a letter he had received from the Western Counties Veterinary Medical Association, also one from Mr. Wm. Woods, jun., in whose absence the Secretary nominated for membership, Mr. Joseph Abson, M.R.C.V.S., of Snighill, Sheffield.

Mr. Thos. Greaves then referred to his recent election as member of Council R.C.V.S., and thanked the members of this Association for their efforts towards placing him in this honoured position.

Mr. J. S. HURNDALL then read the following paper:—

Is there a fixed Law in Therapeutics?

Mr. President and Gentlemen,—I deem it no light honour that the executive of this learned society has considered it advisable to ask me, thus early in my connection with the Lancashire Veterinary Medical Association, to read a paper at one of its meetings for business, and I am deeply sensible that in accepting this honourable position, no slight responsibility rests upon me, for, I take it, that an association which is representative of an important profession in a large and influential county, such as Lancashire, has a right to expect that those members who undertake to furnish, at its periodical reunions, subjects for discussion, shall do so only after careful and deliberate thought, with an earnest desire to do their utmost, according to the light that is in them, to advance the interests of their profession, and if possible so as to extend the sphere of the association's usefulness, beyond the immediate bounds of individual interests. With this view of the essayist's duty firmly implanted in my mind, I felt it was nothing short of a necessity that I should select

the subject which had occupied my serious consideration the most recently, because, with barely three weeks at disposal in which to prepare my paper, it would be well-nigh impossible to formulate definite views and collate facts in a clear and concise form upon freshly studied matter. Ever since I gave my serious attention to the study of veterinary medicine my mind has been more or less exercised by what, from the first, seemed to me to be the very uncertain ground upon which is based the selection of remedial agents for the alleviation of disease ; and as time went on, and I became better qualified to examine this interesting subject, I did not find the difficulty lessened. I turned to the writings of those who, by reason of their learning and experience, were highly qualified to guide my researches into the right groove, and I discovered that these gentlemen, noted though they were for erudition, had been and continued to remain in a chronic condition of uncertainty respecting the true application of therapeutics ; in support of this view of things, allow me to read a quotation from a lecture, delivered some years ago before the Royal College of Physicians of England by the then president, Dr. Paris. Referring to the magnificent collection comprised in the Materia Medica of the the college, Dr. Paris says : "Glancing at the extensive and motley assemblage of substances with which these cabinets are overwhelmed, it is impossible to cast our eyes over such multiplied groups without being forcibly struck with the absurdity of some—the disgusting and loathsome nature of others —the total want of activity in many—and the uncertain and precarious reputation of all ; or without feeling an eager curiosity to inquire from the combination of what causes it can have happened, that substances at one period in the highest esteem, and of generally acknowledged utility, have fallen into total neglect and disrepute ; while others of humble pretensions and little significance, have maintained their ground for so many centuries : and on what account materials of no energy whatever have received the indisputable sanction and unqualified support of the best and wisest practitioners of the age. That such fluctuations of opinion and versatility in practice should have produced, even in the most candid and learned observers, an unfavourable impression with regard to the general efficacy of medicines can hardly excite our astonishment, much less our indignation ; nor can we be surprised to find that another portion of mankind has at once arraigned physic as a fallacious art, or derided it as a composition of error and fraud. They ask—and it must be confessed that they ask with reason—What pledge can be afforded them that the boasted remedies of the present day will not, like their predecessors, fall into disrepute, and in their turn serve only as humiliating memorials of the credulity and infatuation of the physicians who commended and prescribed them." So far Dr. Paris. I might quote much more extensively, would time permit, from this learned man's "Pharmacologia," but the further one goes into the study of his views upon this subject, the more perplexing matters become. Again, in one of the volumes of Braithwaite's "Retrospect" appears the following : "Dr. Johnson (assistant-physician to King's College Hospital) truly observes that on few subjects is there such diversity of opinion as upon the effects of remedies in disease, their modes of action, and the best methods of administering them."

Dr. Sydenham, who has been referred to as the father of English medicine, evidently felt keenly the urgent need of some guiding principle in the selection of remedies, for he says :—"The method whereby, in my opinion, the art of medicine may be advanced turns chiefly upon what follows, viz., that there must be some fixed, definite, and consummate method of healing, of which the common weal may have the advantage. By *fixed*, *definite*, and *consummate*, I mean a line of practice which has been based and built upon a sufficient number of experiments, and has in that manner been proved competent to the cure of this or that disease." Finding that views, so forcibly expressed

by practitioners of great repute, so closely coincided with my own, you will not be surprised, Mr. President and gentlemen, to learn that I was more than ever anxious to discover whether, or no, any suggestion helping to clear away the mist from my mental vision had ever been propounded, and on further search among medical literature I soon found that a claim had been established by one who professed to have discovered a law, by the application of which it seemed possible to bring disease and remedy in closer relation the one to the other ;—in other words, that what Dr. Sydenham, after much experience, deemed essential in the practice of medicine, was really within our reach, viz., "a fixed, definite, and consummate method of healing."

I soon discovered, however, that a very large proportion of the medical profession, and with the exception of a few isolated instances, the whole of the veterinary profession, considered such a thing as a fixed law in the practice of medicine impracticable ; nay, further, I have heard it said that it was undue interference with the liberty of the practitioner to suggest the possibility of a fixed law. I must confess to you, gentlemen, that to my mind that assertion seemed somewhat unreasonable ; for I argued with myself that if the Creator of this world had ordered fixed and definite laws for the regulation of Nature, all of which are rendered subordinate to man's interests here, surely there is nothing so very outrageous or wonderful if in the order of Providence it had been ordained that there should also be a law to assist in determining with approximate certainty what remedies would be applicable to alleviate all the pains and penalties to which poor human nature is susceptible ; and notwithstanding the strong array of opinion against such a possibility, I determined to look into the matter, with an earnest and conscientious determination to find out for myself what might be the truth. I remembered having read how much ridicule and contumely was poured upon Harvey when he first enunciated his discovery relative to the circulation of the blood ; how Jenner was accused of quackery and laughed to scorn by almost the whole of the medical profession when he announced the discovery of vaccination. Yet both of these great and important discoveries came to be generally accepted, and I asked myself, why not a fixed law in therapeutics? As you are all well aware, gentlemen, there are fixed laws in nature ; for instance, the law of attraction in physics ; the law of chemical affinity and definite proportion in chemistry ; the law of diffusion of light in optics ; and why not a therapeutic law? Surely there is in this no very great stretch of the imagination.

I do not appear before you to-night, Mr. President and gentlemen, to dictate and dogmatise to you ; such a role would ill become me in the presence of those who, in virtue of qualification and experience, stand head and shoulders above me in the noble profession of my somewhat recent espousal. At the same time, I should be unworthy to hold my degree did I not, with due respect to my professional confrères, steadfastly maintain an opinion arrived at after mature consideration, even though the same be somewhat at variance with the majority. Such being the case, I have now, on my own behalf, to answer the question involved in the title to this paper in the affirmative, and to state it as my opinion that we have a fixed law in therapeutics. It now becomes my duty to explain on what grounds I deem this to be a fact ; but, in the first place, it is only due to the great discoverer of the law that I should tell you who and what manner of man he was, notwithstanding the probability that you all anticipate to whom I refer, viz., Dr. Samuel Hahnemann.

With a view to conciseness, I propose to give a few quotations from Dr. Dudgeon's biographical sketch :—"The histories of many men who have risen to eminence in some particular branch of science, teach us that they have done so under the most unfavourable circumstances, and in spite of

the greatest obstacles thrown in their way by fortune and by their own natural guardians. Hahnemann belonged to this class of great men. His father, an industrious but fortuneless painter on porcelain in the celebrated manufactory at Meissen, a charming little town on the banks of the Elbe, near Dresden, discouraged all his endeavours to qualify himself for a calling superior to that he himself pursued, though he seems in other respects to have had a great influence on the character of his son by his exhortations to him to exercise his independent judgment in all cases, and not to take anything on trust, but in every case to act as reflection told him was for the best. On leaving school it was the custom to write an essay on some subject, and Hahnemann selected the somewhat unusual one of 'the wonderful structure of the human hand,' a theme which has in our own time been so beautifully discoursed upon by Sir Charles Bell, in his 'Bridgewater Treatise.' Twenty thalers (about three pounds sterling, the only patrimony he ever received), and his father's blessing, were all he carried with him from Meissen to Leipzic, where it was his intention to study medicine. He was allowed free access to the various classes, and managed to support himself by teaching French and German, and by translating books from the English.

"From Leipzic he journeyed to Vienna, in order to witness the practice of medicine in the hospitals there. After a sojourn in Vienna of only three-quarters of a year, he found himself forced to accept the situation of family physician and librarian to the governor of Transylvania, with whom he resided in Hermannstadt two years, and whence he removed to graduate in Erlangen in 1779. 'The longing of a Swiss for his rugged Alps,' he says, in an autobiographical fragment he has left behind him, 'cannot be more irresistible than that of a Saxon for his fatherland.' Accordingly to fatherland he went, and settled down to practise in a small town named Hettstadt, but as there was no field for practice here, he removed, after three-quarters of a year's residence, to Dessau, in 1781."

Dr. Dudgeon then goes on to explain how Hahnemann gave successful attention to the study of chemistry, published many chemical works, the most celebrated of which was a treatise upon poisoning by arsenic.

"In 1789 he removed to Leipzic, and in that year published his treatise on Syphilis. . . . . In 1790 he translated Cullen's Materia Medica, and discovered the fever-producing property of cinchona bark, which was to him what the falling apple was to Newton. . . . . From this single experiment his mind appears to have been impressed with the conviction that the pathogenetic effects of medicines would give the key to their therapeutic powers. . . . . He wrote at this period a large number of chemical essays, and translated several chemical and other works, besides Cullen's, just named. His diligence must have been something extraordinary at this time; . . . . the poverty which Hahnemann endured was not merely an income so small as to prohibit an indulgence in the luxuries of life, but often, very often, an actual want of the common necessaries of existence, and this with all the anxiety of an increasing and helpless family of young children. . . . . The hostility of the apothecaries and physicians of Konigslutter drove him from that town in 1799." After various removals, ... "he planted himself in Eulenburg, but the persecution of the superintendent physician of that place drove him thence after a short sojourn. . . . . The years 1805 and 1806 were eventful ones for the development of his doctrine, and whilst he demolished the time-honoured faith in the medicine of 3000 years in his masterly little work entitled 'Æsculapius in the Balance,' the temple of his own system, of which he had hitherto been only laying the foundations, commenced to exhibit some of those fair proportions which we now admire, by the appearance of the first sketch of a *Pure Materia Medica*, which he gave to the world in

Latin, and of that wonderful exposition of his whole doctrine, entitled 'The Medicine of Experience,' which was published in 1806 in 'Hufeland's Journal.' . . . . During his residence in Leipzic, from 1810 to 1821, he from time to time published valuable essays in the literary journal I have already alluded to, one of which was on a deadly form of typhus that broke out in 1814, in consequence of the disturbances caused by the stupendous military operations of that period, more particularly by the disorderly retreat of the French army from Russia. . . . . A second edition of the *Organon* and five more volumes of the *Materia Medica* appeared during this period, adding at once to his fame, and to the perfection of his system, which began to attract the attention of many physicians, and immense numbers of the educated and upper classes. In the year 1831, the Cholera invaded Germany from the East, and on its approach Hahnemann, guided by the unerring therapeutic rule he had discovered, at once fixed upon the remedies which should prove specifics for it, and caused directions to be printed and distributed over the country by thousands, so that on its actual invasion . . . . those who had received Hahnemann's directions were fully prepared for its treatment and prophylaxis, and thus there is no doubt many lives were saved, and many victims rescued from the pestilence." In 1835, Hahnemann, then in his eightieth year, removed to Paris, surviving some eight years; there he died, full of years and of honour, at the age of eighty-nine, on the 2nd July, 1843.

I must apologise for having occupied so much of your time with an account of the founder of this great system of medicine, but I was anxious to show you what difficulties Hahnemann had to overcome and obstacles to surmount; that his life was not occupied in mere theorizing under the sunshine of prosperity; it would have much more thoroughly contributed to his earthly comfort and prosperity had he continued to practise medicine as he began. This, however, he was too conscientious to do; having the conviction of a great truth in his mind, it must be worked out, even at the cost of personal comfort and the ordinary necessaries of life. He was vilified and calumniated because of the views he expounded, but that was of little import to one who, like him, held it to be his first duty to uphold what he considered to be truth. Such was this great man, and none who prize uprightness of character can, if they study carefully his life and doings, be otherwise than favourably impressed by his example of fortitude, bravery, and perseverance.

The immense amount of work, the untiring zeal, the entire abnegation of self involved in the task which Dr. Hahnemann set himself to fulfil are quite beyond the power of ordinary men to express; and it is only those who will carefully and conscientiously examine such of his writings as refer to this subject that can approximately appreciate the man's character. Lord Bacon once wrote: "Read, not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider;" and this, gentlemen, I respectfully submit, is the frame of mind in which he should be who would study Dr. Hahnemann's views of the action and remedial power of medicinal agents, and the relation of the same to disease. I have already referred to the incident which appears to have first impressed Hahnemann with the idea that "the pathogenetic effects of medicine would give the key to their therapeutic powers"; viz., the fever-producing property of cinchona bark. Following up this mental suggestion by zealously experimenting with other drugs, he satisfied himself that he had discovered a "fixed, definite, and consummate law of healing," and gave expression to it in the formula, "Similia similibus curantur," or likes are cured by likes. Hahnemann's definition of the proposition is as follows: "In order to cure gently, quickly, unfailingly, and permanently, select for every case of disease a medicine capable of calling forth by itself an affection similar to that which it is intended to cure."

Dr. Dudgeon, in another of his extremely able and well-wrought-out lectures, say : "Now this, ... giving us as it were a glimpse, a hint as to what we should do, is very far from instructing us adequately as to how we are to select our remedy for a given case of disease. We have seen how we are to ascertain the affections medicines are capable of producing, viz., by testing them on the healthy individual."

Before proceeding, allow me to remind you that this law, which is one of similars, really means *like to*, and not identical with ; for unless this is carefully kept before the mind, he who would first undertake the consideration of this subject is very easily beset with difficulties, which in reality do not exist. There is a decided difference between similar and identical; nevertheless, I have met with several among my professional friends who have fallen into the error of confounding the meaning of these words. Dr. Dudgeon puts the matter thus : "Had the condition of cure depended upon the discovery of an affection, as the action of a medicine identical with that to be cured, there would have been much less difficulty in making our selection, provided always these identically-acting drugs could have been procured, for identity is something absolute, and admits of no degrees of comparison.

"But such is not the case ; the law of cure is a law of similars only, and similar is but a relative term, and admits of degrees of comparison, as more similar and most similar.

"In considering, therefore, the question of the selection of the remedy, seeing that the epithet 'similar' is not a definite expression, it will be requisite to ascertain, if possible, its limits, to answer the question : '*What is similar?*' for unless that be done, it were vain to think of curing according to the therapeutic law of similars."

Now, in order to arrive at a true definition of the meaning of this law, I must remind you that there are two sets of indications to be relied upon, viz., first, those of the patient ; and, second, those produced on a healthy person, as the result of taking a given drug with the view of ascertaining the effects thereof. If the total and aggregate symptoms produced during a proving of a drug coincide with and are like those existing in a sick person, then you may be assured of having hit upon the right remedy. By symptoms, whether of natural disease or artificially produced by taking a drug in health, I mean a deviation from the normal condition of the body, such as might be observed by the patient or the physician ; they may be objective or subjective. It has been objected that this is treating symptoms and not disease ; that physiology and pathology are alike ignored. This, however, arises from a misconception of the real state of things. Symptoms do not constitute the true essence of disease ; in other words, they are not the disease, but the result of it. Were it not for symptoms, however, we should have no indication of a diseased condition, and without the existence of symptoms, we should be unable to argue that disease existed ; we can only recognise disease through the existence of symptoms.

(*To be continued.*)

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of this Society was held at the White Hart Hotel, Gainsborough, on Thursday, the 26th June, the President, J. Mackinder, Esq., Peterborough, in the chair. The following members were also present :—Messrs. J. Brown, Navenby ; T. Greaves, Manchester ; W. A. Field, Grimsby ; T. E. Smith, Market Rasen ; F. A. Holmes, Hemswell ; G. Osborne, Fulstow ; R. T. Hardy, Sleaford ; J. Hool, Sleaford. Visitors :—W. A.

Taylor, Manchester, and H. Theakston, Gainsborough. Apologies for non-attendance were received from Professors Robertson and Walley, Messrs. H. Howse, F. Spencer, G. Goodacre, B. H. Russell, J. W. Gresswell, W. G. Dickinson, J. M. Axe, and W. S. Carless.

The minutes of the previous meeting were taken as read, Mr. T. E. Smith acting as Secretary in the unavoidable absence of the Hon. Secretary.

Mr. HARDY proposed the election of Mr. James Smith, of Louth, and Mr. HOOL proposed Mr. Geo. Bland, of Boston. Both names were submitted to the meeting, and unanimously approved.

Mr. HOOL drew attention to the inconvenience caused by the hour at which the meetings took place. He suggested that Rule 6 be obliterated, and the time of the meetings fixed by the Secretary, and that the next meeting be at 12.30 p.m.

Mr. SMITH seconded that the next meeting be at Sleaford on the day fixed, at 12.30 p.m. Carried unanimously.

The PRESIDENT then said: Gentlemen, I beg most sincerely to thank you for the high honour you have conferred upon me by selecting me as your President for the ensuing year. I can assure you that nothing shall be wanting on my part to promote the best interests of this association. You have met to hear a paper read by Mr. T. Greaves, of Manchester (a name well known and respected by all), on a subject of vital importance, but before calling on him, I wish to invite your attention to the purchase by this association of some of the most expensive books and instruments for the use of its members. You know full well that there are certain instruments, such as those used in dentistry and lithotomy, etc., which are too expensive for an ordinary practitioner to obtain. I may say other associations have done so, and from what I have heard, it has been a great boon to many of them. (Hear.)

Mr. HOOL asked if the President would propose to buy the books or instruments out of the present funds, and, if so, what instruments would be selected?

Mr. GREAVES said: One instrument purchased by the Yorkshire Association was a tooth forceps, Thompson's shears. He recommended this as a very useful instrument.

The PRESIDENT: I have that myself, and shall be happy to lend it.

After a brief discussion, the CHAIRMAN said he would make inquiries as to the books and instruments required, and report to the next meeting.

Mr. GREAVES reminded the members of the meeting of the Manchester Veterinary Association next month, and hoped they would support him as President of that Association. Four subjects would be discussed. Professor McCall on food supply as obtained from animals; Foot-and-mouth complaints, by Professor Williams; and they expected to have Sir Frederick Fitzwygram, Dr. Fleming, Professor Robertson, Professor Whalley. There would also be a paper on "Influenza in the Horse," by Professor Pritchard, the discussion on that subject being opened by Mr. Edgar, Dartford; also one on "Cruelty to Animals," by Mr. Briggs, of Bury, the discussion to be opened by Professor Pritchard. They would have some of the best men there, and they expected the discussions would be very interesting. He hoped the members of the Lincolnshire Veterinary Medical Society would not forget the 30th and 31st July, at Manchester. The members of the Association are, he said, invited to partake dinner with the Lancashire veterinary surgeons.

The PRESIDENT, after a few preliminary observations, called upon Mr. Greaves to read his paper on

"*Glanders in the Horse: Its Nature and Prevention.*"

Mr. GREAVES, in the course of his paper, said that Glanders was always looked upon as the most malignant, terrible, and dangerous disease to which

the horse was subject, and, unlike almost every other disease, if the Glanders microbe got imported into the system, by any means whatever, its effects in nearly every case were mortal. Influenza, Pneumonia, Enteritis, Hepatitis, and a host of other diseases may attack the system, even in the most virulent form, and subside again, leaving not a trace behind ; but if the real disease-producing element or poison of Glanders or Farcy enters the system it is never eradicated. There is an irregularity and uncertainty in the period of incubation, and some obscurity about it. The patient may rally apparently for a time when enjoying genial and favourable conditions, and may live an indefinite period in an apparently healthy state and the disease be unsuspected, but sooner or later the small living micro-organisms, which really constitute the disease, and which are all the time lying latent in the system, will, when subjected to extremes of heat or cold, suddenly become resuscitated and manifest their full vigour and vitality ; an active ferment is set up, the poison germs are cultivated in the whole system, creating a loathsome, virulent, and putrefying condition of every tissue in the body, and if the animal be not destroyed, in nearly every case death mercifully puts an end to his sufferings. He illustrated his statement, that a patient may rally for a time under favourable conditions and live an indefinite period in an apparently healthy state, by citing two cases which had come under his observation. He had seen cases in which scores of Farcy buds existed with corded absorbents, and nostrils covered with true chancre ulcers and tumefied glands, and in whose lungs there were not the slightest appearance of miliary tubercles. Thus even Glanders and Farcy may exist in some cases, and yet the vital organs not be impaired. In such cases the animal may live for years. His contention was, that had these horses, to which he had referred, continued where they improved so remarkably, where the climate, stables, and conditions were so genial to them, the seeds of disease would have lain quiescent, dormant in them for months or years, and the disease escape detection or identification, but that the seeds of the disease would become resuscitated, and the active ferment set up again at any time if they were placed in altered conditions of extreme heat or cold, favourable to the cultivation or reviving the glander germs which still existed. The germs of Glanders can lie latent in other conditions in other habitats than animal organisms. Percivall, in his "Hippopathology," gives an example at Leschie, where Glanders broke out amongst the troop horses with such violence that the stables were obliged to be shut up, *locked up for thirty years*, but from the circumstances of another war they were again opened, and then from the infection having remained in the stables all the time, the horses that were put into them became immediately glandered. One of the most interesting questions that can occupy the mind of the physiologist is to try to solve the question whether these micro-organisms which produced Glanders in the latter horses were the same micro-organisms which produced the disease thirty years before, or had there been a succession of generations of these micro-organisms during the whole of this period. He believed the cause of Glanders and Farcy to be in every instance referable to contagion—that there must be a specific glander poison or glander germ to produce Glanders—that this specific poison or germ can only produce this disease, it can produce no other disease, and no other poison or germ can produce Glanders. It is an admitted fact that the difference in degree of susceptibility in animals is as wide as the poles. It would be very fallacious reasoning to argue, therefore, that because every horse in a stable where Glanders happens to be does not catch the disease, that Glanders is not contagious. I believe, continued Mr. Greaves, that germs—Bacteria, Bacilli, or Microbes—of any species in certain conditions, may be so cultivated that they shall become more powerful, malignant, and virulent; or some germs —Bacteria, Bacilli, or Microbes—under other conditions, may be so

weakened that they can scarcely produce any effect whatever ; but I do not believe they can be changed in their nature—that is, their species, their individuality. I am not so sure as to whether the glander germ may not be capable of being transmitted and be hereditary. I have a full and confident belief in the advancement of science, and that microscopes and other means will in time advance to that state of perfection that the germ, Bacillus, or Microbe of Glanders, Small-pox, Cattle Plague, and all other infectious diseases, will be detected and known with a distinctness, and individuality, and certainty, and that it will be found that they are as different as the spider and the common fly. Again, because Glanders breaks out occasionally in a foul, ill-ventilated stable, is that a proof that it is the foul stable and not contagion from which it has emanated? I am certain it is not so; it depends upon other conditions. I can tell you that I have known many foul stables where the miasma and strong smells were intolerable, and had been so for many years, but in them Glanders had fortunately never been known, although Influenza, chest diseases, etc., rode rampant. In other stables where the ventilation and drainage could not be found fault with, they being sweet and healthy, there isolated cases of Glanders had a transient existence. To prevent the disease, the consideration of the first and greatest importance is the most careful avoidance of coming near any diseased animal, either in-doors or out of doors, going into an infected stable, or allowing other horses to come into your stables. Next in point of importance is the character of the atmosphere of the stable in which your horses live. See that it is free from pollution or miasma from foul drains, have surface drainage if possible, have your ventilation on correct principles, a current of air through the stable if possible. Sanitary science is all important ; sprinkle quicklime all over the floor twice a-week ; keep your stables a comfortable genial temperature ; good sweet wholesome food, good water ; not overworked, great care taken both in the stable and at work ; all these points attended to, and it will ensure an immunity from Glanders. Supposing the disease has gained an entrance, the producing element radiates ; every horse in the stable imbibes more or less of it. The best course to pursue is to have the affected horse or horses removed at once. If they are decided cases, they should be destroyed at once ; if not bad cases, they can be removed to a distance and kept completely isolated. Secondly, have the stalls they occupied thoroughly cleansed. This consists in having the manger, rack, boskins, and wall well washed with boiling water, McDougall's soap and brush. Put a white-hot fire in a movable grate in these stalls an hour at a time twice a-day for a week. Thirdly, fumigate every stall in the stable with carbolic acid fumes every day for a week, and then twice a week for a month. Fourthly, let every horse in the stable be carefully and strictly examined all over for any symptoms of Glanders or Farcy. This examination should be done twice a-week by the veterinary surgeon himself ; extra care should be taken of every horse, and in this way in nearly every case you may effectually stop its further progress, and get rid of this frightful disease. I fully believe every infected stable may be made clean by these means. In conclusion, Mr. Greaves said, I wish to make a few remarks on the law as it affects Glanders. The law says a man shall give notice to the police of his having Glanders in his shed, but I know of no penalty for his not doing so. If he moves a glandered animal into the public street, he is liable to a fine. The local authority can prevent the movement of all horses out of a stable in which a glandered horse has been standing. This would be in many cases an immense inconvenience and a great hardship—in fact, it would be simply ruin to the owner. At present an Inspector is powerless ; a man may have fifty glandered horses in his stable, and no one can order their destruction ; he may sell any other horse out of the stable not

apparently diseased, and although it may be only passing through the stages of incubation ; he may work them at night and need have no fear of detection, unless some accident or defect attracts the attention of the policeman. Now, to detect and destroy each centre of contagion, and thus prevent its spread, we should have a strict law compelling all slaughter-houses to keep a register, and to make a return of all glandered horses coming into their hands, and state candidly and honestly where they come from. This they do not, they only return such as are sent to them by the Inspector, and they argue that the other cases are unrecognised by them. We cannot force men to see, but we might prevent them from killing any horse with a discharge from his nose, or with suspicious sores on his body or limbs, until examined by the Inspector or a veterinary surgeon. By these means, and by a constant and diligent supervision of slaughter-houses, every glandered stable in the kingdom would become known to the authorities, and then the law could compel all such stables to have surface drainage and undergo the process of cleansing I have indicated. Then Glanders and Farcy in England, instead of being on the increase as at the present time, would become a thing of the past. (Applause.)

(*To be continued.*)

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of this Society was held in the London Hotel, Edinburgh, on Wednesday, May 22nd.

The President, Professor Walley, in the chair.

The following members and visitors were present :—Professors Walley, Williams, and W. O. Williams ; Messrs. Connochie, Boyd, Burnett, Cameron, Storie, Aitken, junr., of Dalkeith, Aitken, junr., of Edinburgh, Pow, Rutherford, Hutton, Grey, Young, Haslam, Meek, and the Secretary.

The minutes of the last meeting were read and approved of.

It was proposed by the PRESIDENT, and seconded by Mr. HUTTON, that Mr. Pow, of Jedburgh, and Mr. Cassels, of Lanark, should be elected members of the Society. The motion was carried. The PRESIDENT nominated Mr. J. H. B. Hallen for election at the next meeting. The SECRETARY nominated Mr. Lothian, of Duns.

It was proposed by the SECRETARY, and seconded by Mr. RUTHERFORD, that Mr. Charles Phillips, 3rd Dragoon Guards, should be elected an honorary member. The election was carried unanimously.

Letters of apology for non-attendance were received from Messrs. Phillips and Hallen.

Mr. BOYD, of Melrose, then read the following paper on "Parturient Apoplexy."

Mr. President and Gentlemen,—The subject which I have chosen to lay before you to-day is one which occupies a deservedly important place in our profession. In general veterinary practice it would, perhaps, be difficult to signalise many topics commanding so much attention from a professionally scientific standpoint. In the first place, its occurrence is frequent, presenting itself for consideration and treatment almost perpetually in a general practice ; and, secondly, its cause seems to have evoked so great a variety of opinion, and, accordingly, its treatment has associated with it so many different therapeutics, that it claims a prominent position in the research of our scientific and practical profession. In the course of my remarks I shall refer to the *cause* of Milk Fever, as it is commonly designated, and thereafter state the remedy which I have personally found in my practical experience to be followed with greatest efficacy. I do not anticipate that my theory as to its

cause will elicit unanimous concurrence, nor do I expect that my usual treatment of it will meet with universal approval. However, be these as they may, I hope the introduction of so important a subject may lead to more interest in it than at present attaches to it. It is simply reiterating what is most commonly known when I say, various are the theories held and promulgated regarding Milk Fever and its cause. When we carefully examine these theories we find that mostly all of them trace their origin to the fact that lactation is arrested, or to its appearance generally at the time of parturition; perhaps the most prevailing idea is that Milk Fever is due to some special influence at the time of parturition, this belief having its foundation in the fact that most of the cases of this kind happen at this period. No one will venture to deny that at this particular time most of such cases do occur; but, in my opinion, the influence referred to is only secondary in Milk Fever, while I grant that it is a strong secondary influence. It may sound very strange to some when I thus assert as my doctrine that the influence of parturition is only a secondary cause. But, in justification of my assertion, before proceeding to advance proof, let me remark that when a veterinary surgeon meets with cases happening a week or weeks after parturition, his doubts are naturally excited as to the accuracy of the theory regarding the influence of parturition, and he is also naturally led on to inquiry. As the result of my experience, and in harmony with the results of my personal research, I entertain the opinion that cases occurring at the time of parturition have always a beginning before parturition actually takes place; that is to say that the primary cause has been in operation before that special period; and the natural result of parturition, viz., the cutting off of the supply of blood between the mother and the fœtus in the uterus is the great secondary cause of the appearance of disease at that period.

Permit me to offer an analytical explanation. It appears to me that Parturient Apoplexy always begins with and is due to irritation of the alimentary canal. If an inquiry is instituted as to the feeding of the patient prior to parturition, it will be ascertained that there has been a change from the ordinary regimen to a sloppy diet to prepare the cow for calving, as the attendant will indicate; or it will be found that the cow has been fed pretty freely on cotton-cake, both of which strongly tend towards irritation of the bowels. This is not a mere surmise or hypothesis. I can undertake to prove that there is irritation of the bowels. For example, if you evacuate the bowels by means of the hand or by the application of an injection, either before the animal is fairly down or immediately thereafter, you will find that the fæces in the vast majority of cases are very hard and dry, but invariably covered with a thick coating of *mucus* and very frequently blood, which indubitably demonstrates that irritation of the bowels exists. You will further find by the introduction of the hand into the rectum that there is a distinct loss of movement; in fact, the bowel is paralysed before. That the disease has a beginning previous to parturition taking place, is taught by the fact that the cow calves with unnatural ease, the calf, as it were, dropping from her without any apparent effort on her part. No symptom could more forcibly express the loss or suspension of nervous energy. Further, if you introduce your hand into the uterus, it imparts the feeling of a lifeless object. This loss of nervous energy in the uterus is secondary, being caused in the following manner. You all know, without any explanation from me, the great or signal effect which irritation of the alimentary canal has upon the pneumogastric nerve; and when you keep in view the intimate connection between the pneumogastric and sympathetic nerves, and, again, the great nervous sympathy between the bowels and the uterus, you can readily recognise the reason of the loss or suspension of energy in the last-mentioned organ.

Now, as to the cutting off of the supply of blood between mother and fœtus being a secondary cause. This blood supply in the uterus is no more needed, and nature has provided the mammary gland for the manufacture of that blood into milk for the maintenance of the offspring. The question now suggests itself, should the mammary gland be in a condition incapable of forming milk what becomes of the blood? Must it not be thrown back upon the system, creating anything but a natural or normal condition? That there is the loss of function in the mammary gland is too obvious to be called in question; but it remains to be asked and settled, how does this loss of function occur? According to my conception, it occurs through the loss of nervous energy, as I have endeavoured to explain, together with the great flow of blood to the part and the very small portion of which is formed into milk, the great bulk acting as an impediment instead of a stimulus. This blood being thrown back upon the system, and the nervous system being in a state of inactivity, is the first to suffer.

With regard to the treatment of Parturient Apoplexy, very frequently too much effort is expended in the direction of *internal* treatment, while too little attention is given to external treatment and the general comfort of the animal. The floor where the animal has to lie ought to receive unmeasured attention. One kind of floor which I would strongly deprecate is that which is laid with sleepers. Such a floor is always in a most slippery state, and so it happens that when the animal is tumbling about, or more especially when she endeavours to rise, she slips and very frequently falls with a leg under her, or she strides herself, and nothing is noticed till it is time she should be on her feet; but being unable to rise, red softening of the cord gets the blame. But on a *post-mortem* being made, it is revealed that the cause is either fracture of the femur or symphysis pubis. If the floor does not sufficiently conform to one's desire, one thing ought to be done at once. Get it covered at once with pretty thick sods, which have a threefold effect. They supply a soft bed, prevent slipping, and absorb any fluid which tends to excoriate. The next thing demanding careful attention is the putting of the animal into a natural position. For if the cow be allowed to throw herself on her side and lie there, free ingress of air to the chest is prevented, the already depressed is still further depressed, and congestion of the lungs will be the result. When the cow exhibits an inclination to lie on her side packing must be resorted to, in order that she may be kept in a proper position. The best means of attaining this end is to use bags well filled with straw or chaff. The whole extent of the spine should be well stimulated, and the animal well clothed to encourage perspiration. When once perspiration has been thoroughly established, great care should be exercised in order to prevent a chill by the removal of clothing, through the movement of the cow or otherwise, else the gravest consequences may follow. The next thing to be kept in mind is, according to the extent of brain complication so are the other organs and functions in degree; a fact which points to the relief of brain pressure as speedily as possible. Under such circumstances, a smart blister should be applied to the back of the head and cold water to the front, the cold to be kept in constant application. This being done, stimulants should be given to maintain the action of the heart and produce perspiration, which I consider a great essential in the treatment of Parturient Apoplexy. I fear that stimulants are too long continued, and that when the animal begins to regain consciousness stimulants should be gradually diminished, both in quantity and frequency. When the cow does so begin to give evidence of consciousness, should another stimulant be given she will again show signs of brain pressure. But, on the other hand, if the stimulants be diminished she will gradually convalesce, which, I think, demonstrates that the brain having been relieved the heart regains tone, and is almost able of

itself to keep up the circulation ; but when a strong stimulant is given, the blood is too rapidly circulated for the still weakened brain, and hence the return of the brain pressure. If the meninges of the brain are congested I find bleeding to be of great service.

I may here mention that the patient ought to be frequently turned from side to side ; but special care must be taken to avoid a chill. In so doing, additional care must be exercised to prevent sprains and bruises of the joints. It is imperative that the bowels be emptied as far as possible by means of warm water injections, and the urine regularly taken off. I am not an advocate for purgatives, and this may appear strange, and possibly inconsistent, when I state as my opinion that irritation of the bowels is the cause of Parturient Apoplexy. Still, I fail to see how purgatives can be of use where the bowels are paralysed, especially through irritation ; they can only add to the irritation by lying inactive in the paralysed bowels. It may be asked, how do you subdue the irritation ? Well, my answer is that the irritation is relieved much in the same way as by the use of sedatives in the cases of irritation of the bowels. Why is opium given in irritation of the bowels but to relieve pain and prevent as far as possible movement in the bowels ? And so it is in Parturient Apoplexy, though the loss of nervous force, sensation, and movement are reduced to a minimum, and so nature regains herself. As to the use of the trochar, I find it of very great service where there is any difficulty in swallowing. How many cows are choked, and how many die of gangrene of the lungs, through medicines getting down the trachea, and how many die for the want of stimulants and from their inability to swallow ! When the trochar is used, and by the means of a small funnel inserted into the cannula, choking is entirely prevented, and the cow still has her stimulants. I have very great success in cases where there is difficulty in swallowing or inability to swallow through the use of the trochar and cannula, and would strongly urge their use. When the cow has regained perfect consciousness she has a depraved appetite, and will eat dirty litter in preference to anything else ; but this must be studiously guarded against. She must be kept on a restricted diet, and by the use of antacids the depraved appetite is removed.

Considerable discussion followed.

Mr. CONNOCHIE, Selkirk, said that he had met with cases showing all the symptoms of Milk Fever occurring as late as ten to fourteen days after parturition. He was of opinion that these were cases of Stomach Staggers. He recommended the administration of stimulants in the first stage of Milk Fever, but was of opinion that the treatment of this disease was generally very unsatisfactory. If the animal was down and unable to rise he advised slaughter. He thought that it was much easier to prevent the disease than to cure it, and recommended strict attention to diet, and plenty of exercise before parturition, and frequent milking afterwards.

Mr. BURNETT, Maybole, thought that about two-thirds of his cases recovered. He recommended frequent milking, the use of fomentations to the udder, and stimulants to the spine, and careful attention to the position of the animal. He was of opinion that internal treatment was very unsatisfactory during the comatose stage of the disease.

Mr. CAMERON, Berwick, said he had seen cases of Milk Fever occurring three or four weeks after calving, and believed it to be similar in its nature to Muco-enteritis in the horse ; that cold, windy weather was the great exciting cause of it. In making *post-mortem* examinations he had found the spinal cord very much softened. He further recommended keeping the beast in a proper position by packing it up on the sternum. He objected to giving large doses of purgative medicines, and recommended the use of hyposulphite of soda, belladonna, and carbonate of ammonia, and bleeding from the milk vein.

Mr. STORIE, East Linton, approved of fomentations to the udder, and believed that the disease was in a great measure caused by the feeding. He had seen cases of Milk Fever occurring before calving. He objected to the administration of large quantities of medicine.

Mr. YOUNG recommended the administration of stimulants. He, also, had met with cases of Milk Fever before calving.

Mr. RUTHERFORD thought that in only one case out of three did the animals so affected recover. In the first stage he approved of bleeding, and the administration of a large dose of whisky and the application of cold to the head. If the animal had gone down, treatment was of little value.

Professor WILLIAMS said that the disease was mainly due to disorder of the digestive organs, and recommended the closest attention to the general condition of the animal, frequent milking and the administration of stimulants, if the animal could swallow.

Mr. CUNNINGHAM, Slateford, had tried the trochar in the treatment of Milk Fever, but did not use it now, as he had seen animals dying from some of the fluids escaping from the stomach and passing into the abdominal cavity. In the earlier stages of the fever he recommended strong purgatives, stimulants, and mustard to the back, but after the animal had gone down, treatment was of very little use.

Mr. AITKEN, junr., Dalkeith, recommended careful attention to the animal's diet at the period of parturition, plenty of exercise, and that the calf be allowed to suck, as measures of prevention.

The PRESIDENT, in closing the discussion, remarked, that while he agreed with much that had been said in reference to Parturient Apoplexy, there were some doctrines promulgated from which he must dissent, as, for example, the doctrine of the essayist that the disease was due to intestinal irritation. In almost all cases of irritation of the bowels, constipation, when present, was preceded by diarrhœa; such a phenomenon was not common in Parturient Apoplexy, there was usually constipation from the outset, and this he attributed to the paralysed condition of the sympathetic system of nerves. Granted that indigestion or derangement of the alimentary functions, when in existence, would exercise a material influence in producing such a disorder as the one under consideration at the period of parturition (and it was a well-known fact that in no animal is reflex nerve-irritation so marked in gastro-intestinal derangement as in cattle), he nevertheless held that it was only one factor in the production of the disease, and that we must look for some other in order to explain its prevalence in cows and its extreme infrequency in other animals; the mere throwing back of the volume of blood upon the system (as was thought by the essayist and others) would not explain it, as, if this were the case, other animals—especially the mare and the sow—would suffer equally with the cow. In an essay which he had the privilege of reading before the Association in 1872, on the subject of Parturient Apoplexy, he, the President, directed attention to the difference in the anatomical arrangement of the cerebral circulation in bovines, as compared with that of other animals, and he was still of opinion that this exercised some influence in the production of the malady; but a still more important factor was to be found in barometrical conditions, as it was a matter of common observation that when one case of the disease occurred it was almost invariably followed by several others, and that too without reference to local circumstances. In reference to the question as to the different periods connected with the act of parturition at which the affection makes its appearance, he thought that much confusion existed on the point in the minds of practitioners, and that this arose largely from the narrow views held as to the nature of these cases, which ought to be classed under three heads: Firstly, *Parturient Convulsions, Delirium*, or *Eclampsia*, and due to excentric

irritation, to loss of blood, or to anæmia of the brain (though the latter condition is stated by some to be present in all cases of Parturient Apoplexy—a great mistake), and occurring in all animals, of all ages, and in all kinds of condition; secondly, *Sanguineous Apoplexy* pure and simple, brought about by blood-pressure, favoured, probably, in adults and fat animals, by organic changes in the coats of the blood-vessels themselves; and, thirdly, *Capillary and Venous Congestion*, produced partly by a plastic condition of the blood, and partly by derangement of the vaso-motor nerve-centre, commencing in the vessels of the spine and travelling gradually towards the head. In these progressive cases the first symptoms observed are disorders of locomotion in the hind extremities, the impression gradually extending to the fore, thence to the cerebellum, onward to the cerebrum, and finally to the medulla oblongata; whereas, in Apoplexy, the animal was struck down suddenly, and unconsciousness supervened almost immediately. The two last conditions, the President remarked, might arise either before parturition (*ante-partum*), during the act (*parturient*), or after (*post-partum*), and might, indeed, occur at any period of the animal's existence quite independently of parturition. In reference to that class of cases which were supposed to occur some considerable time after parturition, he was of opinion that in many instances they were due to thrombosis or embolism, and were of a totally different nature than were those he had classified. As to treatment, he could not agree with those who held that "the less done the better for the patient." On the contrary, he believed that "the more done the better," provided it was in the right direction. Certainly, if the practitioner is called in before the animal falls, bleeding, cathartics, and stimulants, with external irritants, were called for, and, in his experience, had been more productive of good (coupled with forced exercise where practicable) than any other method of treatment; but when the patient was comatose, bleeding and cathartics were useless, as the blood would not flow, and, owing to paralysis of the organic functions, purgatives could produce no effect. Stimulants were, in his opinion, the only class of medicines to be relied on at this stage. Something had been said about the success of homœopathists. It was easily explained: seeing that the greatest indication as to treatment during the comatose stage was to prevent death by apnœa and by syncope, homœopathic treatment was the most rational, consisting as it did in the administration of respiro-cardiac stimulants in the shape of belladonna and nux vomica, readily given in the form of strong tincture on the tongue of the animal; ammonia, the President said, was equally valuable as a respiratory stimulant, but was not so easily administered. As to the modes of administration of medicines, the President pointed out that in the essay before alluded to he had strongly advised (and had done so for many years) the use of the cannula, as with a large instrument and the exercise of care he had never seen any accident happen such as had been alluded to by Mr. Cunningham; certainly he would not trust this mode of administration to ordinary persons. Ammonia could be readily administered in the form of ball, but he did not like the use of the probang, as it exerted considerable pressure on the larynx, and interfered with the passage of air into the lungs; and further, there was just the danger that in the withdrawal of the probang fluid might fall from it into the larynx: he thought that hypodermic injection was not sufficiently had recourse to in the treatment of the affection, considering that such facilities now existed for its practice. In the matter of prevention, much could be done in the direction indicated by some of the speakers, to reduce the number of cases of the disease, and he strongly advised the adoption of such measures, remarking that the disease was rarely seen in animals treated in a natural way. The President concluded by thanking the essayist for the practical manner in which he had placed the subject before them.

Army Veterinary Department.

Gazette, July 1st.

The undermentioned Veterinary Surgeons on probation to be Veterinary Surgeons :—John A. Braddell, Thomas A. Mitchell.

Obituary.

THE Registrar of the Royal College of Veterinary Surgeons reports the following deaths :—James Young, M.R.C.V.S., Newry, and W. Flannery, M.R.C.V.S., Cork, both of whom graduated in 1872 ; and G. B. Webb, M.R.C.V.S., Balsham, Cantab., a graduate of 1861.

Notes and News.

VETERINARY HONOURS.—The annual meeting of the Royal Society for the Prevention of Cruelty to Animals was held in St. James's Hall, London, Lord Aberdare in the chair, and among those present were Lord and Lady Wolseley, Lady Aberdeen, Lady and Mr. A. B. Burdett-Coutts, Sir Walter Stirling, Dr. B. W. Richardson, F.R.S. After the formal business of the meeting, Lady Burdett-Coutts presented the Queen's gold medal to Dr. Fleming, Principal Veterinary Surgeon to the Army, and Professor Pritchard, for their efforts to prevent cruel practices in the treatment of horses. This medal, designed and approved by Her Majesty, is a beautiful example of the medallist's art, and the first recipients of it have been these members of the veterinary profession.

M. Pasteur has received a gold medal from the French Central Society for improving the breeds of dogs, and for his researches in Rabies.

EAST AFRICAN HORSES.—Burton, on his journey to Harar, in East Africa, remarks :—" I was disappointed by seeing the boasted ' Faras ' of the Somal, in the shape of ponies hardly thirteen hands high. The head is pretty, the eyes are well opened, and the ears are small ; the form also is good, but the original Arab breed has degenerated in the new climate. They are soft, docile, and—like all other animals in this part of the world—timid : the habit of climbing rocks makes them sure-footed, and they show the remains of blood when forced to fatigue. The Gudabirsi will seldom sell their horses, the great safeguard against their conterminous tribes, the Eesa and Girhi, who are all infantry : a village seldom contains more than six or eight, and the lowest value would be ten cows or twenty tobes. . . . Whilst other animals have indigenous names, the horse throughout the Somali country retains the Arab appellation ' Faras.' This proves that the Somal, like their progenitors the Gallas, originally had no cavalry. The Gudabirsi tribe has but lately mounted itself by making purchases of the Habr Gerhajis and the Habr Awal herds."—*First Footsteps in East Africa*, p. 220.

SENSE OF SMELL.—In Java wild hogs are most destructive to the plantations. " The practice of suspending rags impregnated with urine, at small distance around the plantation, is universal over the whole island. These animals are said to have so violent an aversion to this odour, that even this ' feeble barrier ' is useful in preserving the plantations."—*Stamford Raffles, Hist. Java*, vol. i., p. 50.

FEEDING FOR A JOURNEY.—The Mongols prepare their camels for a journey by depriving them of meat and drink for twelve days ; and our horses are allowed to fast for a night to strengthen them —*Timkowski Travels through Mongolia to China*, vol. ., p. 12.

Correspondence.

RED MANGE IN DOGS.

DEAR SIR,—Referring to "Zero's" questions in the June number of the VETERINARY JOURNAL, with reference to "Red Mange" in dogs, will you kindly allow me, through the medium of your valuable Journal, to recommend him to consult the work on "Diseases of Dogs," by Mr. James Moore, M.R.C.V.S., which was published thirteen years ago.

I am, dear sir,

Yours truly,

"UBIQUE."

COMMENCING DEGENERATION OF THE PROFESSION.

DEAR SIR,—In studying natural history, the student sometimes comes across cases where a member or members of a group, after arriving at a certain stage of development, have, instead of developing into higher forms, as one would have expected from its previous history it would do, gone back or degenerated. And turning from natural history to the history of nations, we find instances of the same thing: where a nation, after attaining to a high state of civilisation, has not only failed to keep the high position already gained, but has retrograded. Reasoning from this, we come to the conclusion that a nation or an individual, after reaching a zenith higher or lower in different cases, degenerates. And if we take a profession, and reason from analogy, we will arrive at the same conclusion. Now, if this be so, and from the cases recorded we cannot doubt it, the fact—the melancholy fact—forces itself upon us, that the youngest of the professions, the veterinary profession, has not only reached its zenith, but has begun to go back.

Any one who has noted the results of the final examination for the past year, and compared them with the results of previous years, cannot fail to have noticed that during the past year not a single student at any of the colleges has passed his final examination with credit. And as the students of to-day will in no far-distant future form the profession, one cannot help thinking, sad though it be, that the profession, composed of such degenerated members, will occupy but a low place amongst the other professions.

And is this *really* so? Is the student of to-day so much behind the student of two, five, or ten years ago? Let us ask the teachers in the schools. What do they say? They will not allow it, and say that the student of to-day is an advance on the student of ten years ago in intellectual capabilities. What say the examiners? Here is what one of them said: "Half of the students who come up for examination should be rejected, and the other half kicked out of the profession." I would be sorry to think this latter statement was true, and would rather believe that that examiner was such a clever student himself that no student of the present day can reach his standard of excellence. Then how is it that students cannot obtain credit in their final examination? Obviously it must be the result of one or more of three causes. The teaching *at all the schools* must be defective, or the students of the past year were of inferior calibre, compared with those of previous years, or the examination is unreasonable. Which is it?

I remain, sir,

Yours sincerely,

Edinburgh, 23rd June, 1884. W. R. DAVISON, M.R.C.V.S.

DOCKING.

SIR,—A great deal of controversy seems at present to be going on about the operation of docking horses' tails. Much has been said *pro* and *con;* but it is not my intention here to argue the matter, as this would be time wasted. I intend simply to give you the method I have advocated and performed for the last nine or ten years. I remove one-third of the tail, not when an animal is two or three years old, but from three days to a month. The operation, which is really no operation at all, is performed in the following manner: Take hold of the end of the tail by one hand, and with a sharp knife in the other sever the tail any length you choose. Then tie a piece of string round the hair, close to the stump, and the operation is over. My experience shows me that the tail thus treated never grows beyond the "fancy" length; that it is much finer at the end; that there is no bare stump showing; there is no trouble in stopping the hæmorrhage, and the pain is reduced to a minimum.—Yours, etc.,

JOHN NETTELTON.

Northallerton, *July 14th*, 1884.

CORRIGENDA.

MR. CUNNINGHAM desires the following correction to be made in his letter which appeared in the Journal for last month. At page 71, para. 2, for "thickly populated," read "thinly populated (and less-favoured parts of the country)."

ANSWERS TO CORRESPONDENTS.

B. C.—There is a translation of Burggraeve's "Dosimetric Therapeutics" by H. A. Allbutt, published by D. Bogue, London, 1882.

M.R.C.V.S.—The questions pertaining to the last examination for the Fellowship Degree of the R.C.V.S. will be found in the Journal for this month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from W. R. Davison, Edinburgh; J. Donald, Wigton; J. B. Wolstenholme, Manchester; F. Spencer, Wragby; G. A. Hollingham, Red Hill; "Ubique"; A. W. Hill, London; R. W. Burke, A.V.D., India; R. H. Dyer, Limerick; F. H. Lewis, Edinburgh; W. H. Blunt, Lutterworth; J. A. Nunn, A.V.D., Lahore; I. Matthews, A.V.D., Lucknow; J. Nettelton, Northallerton.

BOOKS AND PAMPHLETS: *F. Gutenäcker*, Die Lehre vom Hufbeschlag; *C. A. F. Lindorme*, Scientific Basis of Eclecticism in Medicine; *H. Pütz*, Ueber die Milzbrandimpfungen Pasteur's; *M. J. Hugues*, Hygiène Publique; *A. Zundel*, Quelques Considerations Economiques sur la Fièvre Aphteuse.

JOURNALS, ETC.: *Oesterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Nature; Live Stock Journal; Archiv für Wissenschaftliche und Praktische Thierheilkunde; Annales de Médecine Vétérinaire de Bruxelles; Wochenschrift für Thierheilkunde und Viehzucht; Der Thierarzt; Lancet; National Live Stock Journal; Medical Times and Gazette; British Medical Journal; Der Hufschmied; Archives Vétérinaires; Edinburgh Medical Journal; Recueil de Médecine Vétérinaire; American Veterinary Review; Journal de Médecine Vétérinaire et de Zootechnie; Revue Vétérinaire; L'Echo Vétérinaire; Clinica Veterinaria; Medical Press and Circular; Animal World; Tidskrift för Veterinär-Medicin och Husdjursskötsel; Practitioner.*

NEWSPAPERS: *Daily News; South Eastern Gazette; Irish Times; Leeds Mercury; Glasgow Herald.*

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

SEPTEMBER, 1884.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 83.)

IT may be asked why crib-biting was considered at so early a stage of these observations. Perhaps, too, it will be argued by some that the disease—or habit, as it has been, I think, improperly designated—would more consistently have occupied a position in the catalogue of diseases of the digestive organs. My reason is obvious. These remarks not being intended to supply, or take the place of, a work on pathology, it is at that stage of our examination as to soundness that our attention is more particularly arrested by it. The same remarks are applicable to the next inquiry we shall make, viz., into the state of the *nasal cavities.*

It is needless to call attention to the importance of this subject, as it will be anticipated that that loathsome disease, Glanders, will be hinted at. The salivary glands and the Schneiderian membrane are so intimately concerned, the one with the other, in these examinations, that I shall purposely connect them. It may assist us in our inquiry if we take a glance at the structure and function of these parts. The nose is divisible into hard and soft parts. The former are the bones and cartilages; the latter, the lining membrane of the various cavities and passages. These cavities are denominated the nasal fossæ, and the different sinuses. There are five cartilages

belonging to the nose. The septum nasi is that which divides the two sides. Both sides are covered with mucous membrane. These are what have been termed true and false nostrils ; the true are the larger, and which are always open ; the false are small pouches, or *cul-de-sacs*, situated internally above the true. They are formed of integument, which is exceedingly thin and soft. The Schneiderian membrane is by some anatomists called the pituitary membrane, from the nature of its secretion. It was formerly believed that this secretion proceeded from the brain, until "Schneider" demonstrated and made known to the world that the secretion proceeded from the mucous membrane. It is closely attached to the periosteum, to the cartilages, and, in short, to all the passages and cavities of the nasal fossæ ; it is very thick, very vascular, and distinguished for its olfactory papillæ ; it is strictly a mucous membrane, is pink in colour, but subject to change by cold, which is often produced by atmospheric influence. From the nasal fossæ it may be traced through the nasal duct to the conjunctiva, along the Eustachian tubes to the pharynx and mouth, and from thence through the lungs and alimentary canal. It is very smooth on its external surface ; the lateral nasal artery, the facial, and the palato-maxillary furnish abundance of blood for its secretion ; the first and fifth pair of nerves supply it with all it requires from this source.

The olfactory nerves appear to be very sensitive ; they ramify over nearly every part of the mucous membrane, by which the horse is endowed, as it were, with the power of touch. Smelling to the horse, is what touch is to man. When the vastness of the mucous surfaces in the equine race is considered, more especially in the air-passages, we need wonder but little at finding a considerable quantity of fluid secreted in *diseases* of this membrane. It has been calculated that the number of air-cells in the human lungs amount to 600,000,000!! If this be an approximation to truth, and if the same might be compared with the increased volume of lungs in the horse, it goes far beyond my comprehension to imagine the extent of surface of the mucous membrane of our patients.

I am free to admit most of us take but a hasty glance at this membrane when called upon to examine a horse as to soundness.

If any quantity of discharge is found in either nostril, it is our duty to look closely at it; also to the submaxillary glands, and to the peculiarity of the cough, should one be present. I am anxious to impress this upon the minds of your readers, as I am convinced more animals are passed as sound ones than ought to be.

It may be in the recollection of a few of your readers that I recorded a case in the *Veterinarian*—vol. xxv., page 380—that I was interested in, an experiment which was instituted for the purpose of ascertaining if the mucous discharge from the left nostril of a pony had the power of propagating disease. This was done in consequence of the owner of the pony having lost a young and valuable horse from Glanders. I repeat, we cannot scrutinise too closely any secretions from the membrane of the nose when met with, and especially if we find the horse *free* from cough. The diseases of this part of the air-passages are not numerous; and it is probable but a few will be noticed. I shall, therefore, in this paper refer to two or three—viz., Catarrh, Nasal Gleet, and Glanders. A common Cold, as it is termed, as a general rule, soons runs its course. It is frequently removed by a little good nursing, and sometimes without any attention. There are cases, however, of simple Catarrh which leave behind them something that is annoying to the practitioner as well as the owner of the horse. I allude to *whistling*. Polypus is a disease so little known with us that it needs no notice here. Nasal Gleet is, I think, a disease which is thought but little about by horsekeepers generally. It is, in consequence of its being considered of *no* importance, nearly as dangerous, if not more so, than Glanders, since in the one case no person is careful, and in the other case *all* are. An animal having discharge from the nostril—and the left has invariably been particularised—however small in quantity, *and of long standing*, should, at all times, be critically examined, and, if need be, an ass made the subject of experiment from it. My own practice has taught me that these occasional discharges are very serious, and most of them are capable of producing disease. It becomes, therefore, our duty to inquire into the cause of Nasal Gleet, and to point out any peculiarities which may lead us to safe conclusions in pro-

nouncing an animal to be *sound*. It is an universally received opinion that that which is called and which surgeons understand by the term of inflammation of the Schneiderian membrane is the principal cause of nasal discharge. Although it has been argued that this affection is produced *without* inflammation having existed, I am not inclined to believe it. It does not follow that such has *not* existed, because the owner or groom has not seen it. These attacks are of so mild a form frequently that it is quite possible we might not be cognisant of the existence of inflammation. Gleet is supposed to be a disease left by a chronic attack of inflammation of the mucous surfaces, and that aged horses are more susceptible of it than young ones. The *colour* of the membrane is not of that healthy pink; it now assumes a darker, a sort of lead-coloured hue, which must be seen to be thoroughly understood. The discharge is of various consistence, now thick, at another time thin, and so forth. It is, however, at that stage of the complaint when the disease is supposed to have been cured, or no disease at all exists, that we are likely to have our attention directed to it—when it is, in fact, what the owner or breeder of the animal would call "nothing."

(*To be continued.*)

SPASMODIC COUGH CAUSED BY AN AWN OF WHEAT.

BY J. A. NUNN, A.V.D., LAHORE.

THE subject was a grey Guzerattie bull about a year old, which was admitted into the Lahore Veterinary School on June 5th, 1884, suffering from a spasmodic cough, which the attendant stated to have been first noticed about three weeks before. The animal was in somewhat low condition, and tucked up in the flanks. The cough was spasmodic, coming on in paroxysms from time to time, and during and just after these spasms a large quantity of frothy mucus was expectorated from the mouth. Nothing abnormal could be detected on auscultation or examination; the temperature remained normal, and the bull fed well. On the 15th June, during a fit of coughing, a whole ear of bearded

wheat, with the awn attached, was expelled from the left nostril, covered with mucus. The animal recovered rapidly and was discharged cured in two days afterwards. The interesting point in this case appears to me to be the length of time the wheat-ear remained in the nostril.

"BURSATTI": RECORD OF CASES DURING 1883.

BY RICHARD WM. BURKE, M.R.C.V.S., A.V.D., INDIA.

ON the 10th of April last I was consulted by Mr. Clifford, District Superintendent of Police, Benares, with reference to a horse belonging to a police *sǎwâr*, which was said to be suffering from debility ("weakness"), and unable to perform its work, the result of the disease well known among horsemen in India as "Bursatti." I examined and found the animal presenting, externally, a tumour, or tissue-growth, of the size of a cricket-ball, on the near hind inside of fetlock, having a fixed base, and attended by slight discharge, which was sero-sanguineous, not purulent, in character. Ulceration of the skin covering the near lachrymal and nasal bones also existed; discharge present, which was more of the nature of *tissue-slough* than true purulent material. Dislodged a few nodular cell concretions, soft and friable, and apparently in the fatty stage, by the fingers from the surface of the sore and exposed edges of the skin. Percussion and auscultation of the chest revealed patchy dulness and loss of respiratory murmur at points corresponding to the morbid changes on both sides of the lungs, but especially towards the anterior lobes. Dry, harsh cough, icterous condition of the visible mucous membranes, "staring" coat, and general debility —cachexia—were among the principal symptoms noted; and considering the expense of his feed, the present condition and past history of the animal, that he had had a former attack of the disease and was now incapacitated for work, and was repulsive to the eye, I advised destruction. Mr. Parsons, who shortly relieved Mr. Clifford, some twenty days later placed the animal at my disposal as "worthless, and incapable of rendering further service." I thereupon availed myself of the opportunity and had him shot.

Post-mortem examination showed—*pseudo*-tubercles, inaptly termed *kunkur* in the vernacular, in the lungs and liver, and sparingly scattered also under the capsule of the spleen; presence of numerous "false bronchi" in the lungs, such as to be met with in Fibroid Phthisis* of man; and the conversion of portions of the pulmonary texture into "lumps," due to fibroid substitution; total absence of any true suppurative changes in connection with the morbid processes found set up here. In the lung-tissue most of the nodosities had undergone caseous change, whilst others showed varying degrees of calcareous deposition in their histologic constitution. (From notes taken at the time.)

Case II.—Brought for my opinion, suffering from a hard, large, cauliflower-like growth in front of the off fore phalanx, in a c. b. pony, ten years old, very much emaciated, and having a hacking cough, which was attended by a crumb-like, nearly dry discharge, expelled through the bronchi *viâ* the trachea and nasal passages. My prognosis was unfavourable, and I advised destruction; but the owner did not agree to my proposal, and some time later, about a month, came and informed me that his animal had since died, doubtless from exhaustion, as he had "refused his feed for some days before his death." No *post-mortem* examination could be made, as the body was disposed of before the information reached me—31st December, 1883.

Five cases† treated during the year among the horses of G 1, Royal Artillery, Benares. In all cases my experience was that the use of caustic dressings to the sores had a prejudicial effect; whilst recourse to the actual cautery and desiccants was followed by better results. Of the desiccants MacDougal's powder I have found to be the best, as it is also an antiseptic and prevents tissue decomposition. By causing removal of moisture *it prevents cell proliferation in the sores* (Dr. Moxon‡), and becomes of

* Fibroma.

† Two of these were in Australians; three, stud-breds. In one case now under observation, discharged "relieved," distinct friction sounds can be heard by applying the ear to different parts of the chest, especially after exercise, when this is most clear.

‡ Jones and Sieveking's "Pathological Anatomy," chap. "Epithelial Cancer."

especial value in the treatment of these cases. (From record of treatment.)

Case VIII.—Subject, a dun c. b. gelding, eight years old, brought for my opinion in Benares, presenting sores on the prepuce, one at the near commissure of the mouth, and another on the near hind fetlock, in front and outer side; general debility; no fever*; slight jaundice; subject to attacks of recurrent diarrhœa. As the owner (a native) could not pay the feed and keep of the patient, he was unwilling to have him treated, and decided upon trusting to nature to effect a cure! I therefore lost sight of the case, which might have furnished good *post-mortem* information. (From notes.)

Case IX.—A c. b. horse, six years old, belonging to a clerk in the Survey Department, treated gratis, died of Tetanus, the result of the operation I performed on this animal. My patient was brought to me about last Christmas, with sores involving the fetlock and back tendons of the near fore, and others on all hind heels and back of off hind pastern, which were of diminutive size in comparison to the disease changes found set up in the fore. The hot iron was simply applied to these, and afterwards dressed with desiccants, whilst from the fore I dissected out all the diseased tissues as cleanly as I could, and all appeared well for the next two or three days, when luxurious granulations made their appearance about the wounded surface, the surrounding skin becoming inflamed and œdematous, and high fever set in on the fourth day. The following morning I noticed he got "locked jaw," and was breathing with great difficulty, his visible mucous membranes were of a dark yellow, bowels costive, and he had already begun to show signs of rapid emaciation supervening. On the eleventh day from that of the operation the new growth had become half as big, nearly, as the original growth, now of the size of my fist—red, spongy, easily broken down by the fingers, *except at its base*, and attended by a foul discharge. I was afraid to irritate the sore with caustics, and

* I have carefully noted the temperature in all such cases, and during various stages of development, but have never found the thermometrical readings to range higher than 100·4 to 101 F. And this fact is significant in its pathology, as marking a difference between it and truly *specific* (contagious) diseases.

therefore had recourse to poultice. My patient, however, died on the fourteenth day.

Post-mortem examination disclosed the following:—Sub-endothelial miliary granulations and patchy consolidation of the lungs, due to exudation into the parenchyma, and subsequent conversion of that exudate into a pearly-white or grey and amorphous material, compensatory emphysema of the right lobe, especially towards its base or upper border; thickening and corrugation of the endothelium covering portions of both lungs, due to hyperplasy of the sub-connective tissue; hypertrophy and induration of the mesenteric glands; miliary deposits under the peritoneum, visceral and parietal; similar deposits under the capsule of the liver, and also into the substance proper of that gland. Muscular tissue of the body pale and flabby, and possessing a sickly odour. General icterus and anæmia. Perhaps the muscular changes were dependent on high *traumatic fever* which preceded death in this case; probably also on changes in nutrition, brought about by general debility. Slight injection of the coverings of the spinal cord.

General Observations.—What most strikes the pathologist is the fact that the changes found *post-mortem* in this class of cases are "dry," as distinguished from the occurrence of vomicæ and general "discharge" common to the lesions of other more acutely inflammatory disorders which are dependent on a specific cause: *example*, Strangles, Pyæmia, Glanders-Farcy, and Tuberculosis. No lesions are produced in "Bursatti" in the least comparable to the intensity of these specific diseases. Finally, the textures of organs thus affected do not usually "break up," as common in specific affections. All this notwithstanding, we cannot but express surprise at the great voids that have obtained in the past history of the pathological anatomy of "Bursatti"; and it can easily be understood that the pathology of the disease has all along been only a series of surmises, and even overt and ill-considered statements. The only just conclusion of its pathology, we may affirm without much fear of contradiction, is to be drawn from a consideration of the disease in all its combined aspects, namely these: its clinical (medical, surgical, and statistical), histological, anatomo-pathological and experimental; any

of these aspects, singly considered, however elaborate, must surely lead to confusion, and put back by a step the already ascertained facts in reference thereto, and thus misinterpret its right pathology. The want of proper record of its pathological anatomy being kept, has led to the disease being confounded with other affections which have only a surface resemblance to it, or have certain characteristics common with it.

Thus we find the theory of a "vegetable parasite" asserted without any reference to the numerous other considerations bearing on the important question of this disease, and regardless of the errors in judgment so common to all minute investigations of parasitic life by the best experts. The so-called *kunkur* of the disease was first examined by Dr. Fleming, LL.D., and Dr. George Thin, of England, who pronounced them to be simple *cell concretions*. Some years later Mr. J. H. Steel announced that he had actually cultivated the "fungus" found in the "*kunkurs*," and distributed specimens prepared by himself for microscopic examination. One of these I obtained through the kindness of Mr. Fleming, which I at once made over to Mr. Garside, then at the Brown Institution, London, and requested the favour of his opinion on what were labelled as "indubitable fungi." This Mr. Garside very kindly consented to do, and on consulting with Dr. Roy, F.R.S., the resident professor of the institute, he subsequently informed me that the result of their combined examination had led them to the conclusion that what were described as fungi were neither more nor less than ordinary *tissue débris*, having nothing in common with the nature of *fungus*. Opinions have differed widely about the subject heretofore, judged upon abstract principles, and characterised by some important omissions. There is a judgment finally passed upon all important questions by the verdict of common opinion, which is not formulated upon pre-belief, or based upon the issues of dialectical contests, but is slowly formed by the joint opinion of all the profession. Before that judgment arguments thought irrefutable wither into insignificance, theories which but yesterday had their eager defenders, are suddenly seen to be indefensible, and changes in opinion opposed by all the resources of logic and sophistry are found to be inevitable. In a foregone volume of

the Journal will be found a summary (brief) of the nature of the disease products found *post-mortem* and in the sores of this disease, by Dr. Fleming.

This, then, is the state of our present knowledge with respect to the pathology of "Bursatti"; and it remains now for us to show how much more can be determined in regard thereto by a study of its clinical, morphological, and experimental characteristics. Mr. Steel* points out with some stress "that the line of research which must be taken here is evidently that of experimental inoculation and culture." This can be correct only in the abstract. It appeals too much for the benefit of one branch of inquiry, and too little for that of all the other branches. We may be in error in taking this view, but, if we might make a suggestion, we would lay greater stress upon the importance of study of the component sciences. We must not think anything too trivial for the gravity of our intelligence which is not too trivial to diminish or intensify animal suffering. We must pourtray in vivid terms the growth, development, course, and termination of the sores; their behaviour in causing surrounding infiltration of structures, and their power to secondarily invade remote organs; the duration of the disease, etc. The pathologist will not disdain to make a careful record of the *post-mortem* examination of horses that have been destroyed for or by the disease, and to note the character of the lesions he will so determine, of the analogies they might bear to other pathological conditions, and of the dissimilarities they might present during different stages. The progress of the external disease to internal structures will form an important part of his study. While the importance of microscopically investigating the characteristics of the sores *in their various stages of growth*, of the effects of inoculation and other experimentation, of different modes of treatment, of prevention, of the discovery of its origin and causation, predisposition or otherwise of sex, age, climate, dietary, of heredity or non-heredity, cannot be over-rated. Exclusive dependence upon the external manifestations of disease is not, as was once thought, the right method of exploring its nature. The physical properties of disease, its pathological effects and physiological action,

* *Quarterly Journal of Veterinary Science in India*, vol. ii., 1884.

can only be obtained by careful and reiterated observation, clinical, *post-mortem*, and experimental. There is not the least use shirking the fact that any of these, singly considered, will lead to incomplete results.

(*To be continued.*)

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 109.)

Gradually the subject attracted the attention of a certain number of medical men, and these began to combat, with some degree of success, the idea that the malady was syphilitic in its nature. Among these persons we may mention Zink (1764), Ruhling (1774), Heim (1782), and the special physician of the Grand-Duchy of Mecklenburg, Graumann, who has written the best treatise on Tuberculosis and its non-identity with Syphilis. Unfortunately these *savants*, in proving that this disease was different from Syphilis, *also taught it was not contagious, and that, consequently, the flesh of animals affected with it might be consumed with impunity.*

This inexact and hasty conclusion, still more unfortunately, had additional serious consequences, for certain physicians, animated by an excess of zeal, publicly advertised the good quality of such flesh. A tuberculous ox having been slaughtered at Brukenau, Zwierlein, a doctor of medicine and philosophy, took twenty-five pounds of its flesh, and consumed it himself, in order to demonstrate that such meat was destitute of the injurious qualities attributed to it. What is more, this doctor prepared a quantity of broth made from tuberculous nodules, and drank it in the market-place before a large number of people.

These ideas gaining ground, the various Governments were obliged to intervene by ordinances, and rescinded the previous laws passed with regard to this flesh. So it was that the Prussian Government published on June 27th, 1785, an official notice in the following terms :—"That in order to terminate the unjustifiable practice of handing over the flesh of tuberculous animals to the public executioner, there is need—

"1. To enlighten the public on this question.

"2. To make known the true state of things with regard to the action of the flesh of tuberculous animals, which a mere prejudice has generally given rise to the idea that it is injurious to health; and

"3. To afford instruction as to the course to be henceforth pursued with regard to this flesh."

In this proclamation it is also stated that the flesh and milk of animals affected with Tuberculosis should not be considered suspected, except in cases where the lesions of this malady are present, and then the diseased portions were to be removed; the remainder of the carcase being left for the disposal of seller and buyer, as it might, without the slightest prejudice, so far as health was concerned, be utilized as food.

A circular issued by the Imperial Government of Lower Austria on June 11th, 1788, contained a less categorical decision. In this document, it is admitted that the tuberculous growths are found in the healthiest animals as well as in diseased, and that the flesh of the latter is in itself healthy. If, nevertheless, it is added, such growths are found in the abdominal cavity and in the other regions of the body, and if the animals had been cachectic and nymphomaniac, their flesh should be considered as injurious to the health of mankind, and its use should be strongly discouraged.*

In Southern Germany, Austria, and Switzerland, the flesh of tuberculous animals was always more or less rejected. In these countries it was certainly admitted that the flesh of cattle in good condition, even though some tuberculous nodules might be found on the pleura or peritoneum, was not unfit for food, though care was taken to remove the nodules from the serous membranes before disposing of the carcase for alimentary purposes. If the nodosities were numerous, or seated in the lungs or liver, these organs were rejected for food, and the flesh was sold as of inferior quality, if it had a good appearance. The carcases of animals which were wasted and much diseased were not allowed to be used as food.

A police regulation, issued in the Duchy of Baden in 1772,

* "Contributions Choisies à l'Art Vétérinaire." Part iv., p. 249. Leipzig, 1788.

relative to the inspection of flesh, is framed on these lines. Another ordinance of veterinary sanitary police which appeared in 1840, in the Canton of Appenzell-Ausserhoden,* shows that at that date a similar practice, still existing, was in vogue in Switzerland. In this document, three degrees of tubercular Phthisis are distinguished, with regard to the consumption of the flesh of diseased cattle. The *first degree* is characterised by only a few tubercular growths, and the healthiness of the flesh and viscera. In the *second*, the growths may be everywhere in the organs, but the flesh is still in a good state; but in the *third degree*, the neoplasms are so numerous in the pleural and peritoneal cavities, as well as in the viscera, that the flesh is evidently altered, being changed in colour, and the connective tissue is infiltrated with serum. That of the first and second degree is allowed to be sold for food, but the purchaser has the right to demand from the seller a reduction of twenty per cent. Flesh of the third degree is not admissible as food, and the carcase, with the exception of the skin and fat, must be buried. The fat may be used for other purposes than human food. Any damage incurred falls upon the seller.

Bavaria, Wurtemberg, and the Grand Duchies of Baden and Hesse have, in their latest regulations with regard to meat inspection, maintained these indications in principle, thus respecting the ancient and popular custom. For instance, in the regulations for the Grand Duchy of Baden, published in November, 1878, it is laid down that flesh is to be rejected which comes under the three following categories:—

1. That which has a bad smell or is putrefying.
2. That of animals which have been overdriven or exhausted.
3. That of animals which were affected with Anthrax, Rabies, Glanders, Farcy, *tubercular Phthisis* (pulmonary or serous) *to an advanced degree*, Trichinosis, Measles, or any disease marked by the decomposition of the nutritive fluids.

It is likewise mentioned in the instructions relative to the inspection of meat, that *if the morbid alterations have only invaded certain parts of the animal, these are to be excluded from consumption as food, and the remainder may not be exposed for sale*

* "Contributions Choisies à l'Art Vétérinaire." Part iv., p. 249. Leipzig, 1788.

in the ordinary butcher's stall, but must be sold as inferior meat, in establishments ad hoc. It is also *forbidden to expose for sale, or to sell, flesh from animals showing marked and extensive lesions of tubercular Phthisis.*

While in the South German States meat inspection has been carried out for centuries in all the districts, by means of experts —empirics or skilled persons, such inspection being still in force; in the centre and north of the German Empire, the arrangements for the inspection of slaughter-houses and carcases, which were introduced towards the end of the last and commencement of the present century, when Cattle Plague was so prevalent, have disappeared.

In recent times, nevertheless, a considerable number of German towns have instituted abattoirs, in which all animals intended for food are slaughtered, and the authorities take the precaution to have the meat inspected. Among these towns may be mentioned Berlin, Hanover, Dusseldorf, Elberfeld, Erfurt, Cassel, Munich, Stuttgart, etc.* In several localities in North Germany, because of outbreaks of Trichinosis, inspection of certain meat is obligatory; and in Prussia, since March 18th, 1838, there is a law with regard to public abattoirs, in which *all* the animals intended for the food of people in the different localities must be slaughtered.

The penal law of the German Empire, and the arrangements relative to the trades and professions in force in that country, interdicts the sale of improper flesh; and on May 14th, 1879, there was promulgated a law of the empire, dealing with the traffic in food, and prohibiting the sale for slaughter of animals affected with certain maladies, or the flesh of these. The sanitary board of that empire has already drawn up an ordinance in view of these interdictions, so that it is to be expected that in the near future there will be uniform measures throughout the whole country, and which shall be applicable to slaughter of animals affected with Tuberculosis, or their flesh. In the meantime, the towns and localities of any importance are endeavouring to concentrate slaughtering in public places open to inspection.

* In the United Kingdom, only a few towns have abattoirs, as Edinburgh, Glasgow, Liverpool, Manchester; but I fear meat inspection in them is not one of the objects for which they were instituted.—G. F.

In France, the inspection of meat has attracted the attention of the authorities from the earliest times. Besides the Act already alluded to, may be mentioned the police code of 1767 in force in that country, in which are regulations relative to the sale of animals which have died of disease, as well as the laws of August 14th, 1790, and of July 22nd, 1791.

Dalloz, in the following quotation, shows how the prohibition of the sale of flesh of tuberculous animals is provided for in these enactments.

"The same may be said of the flesh (prohibition of sale) of an animal killed when diseased. Certain maladies act, in fact, on the living animal as the laws of decomposition and fermentation do on the dead one; for here occur one of those spontaneous transformations which alter the flesh and prevent its being used as food. The prohibitions in the old regulations were not less formal on this point . . . . otherwise, before the law of 1851, they appeared to adopt the same solution, for an order of the Cour de Cassation, of 13th August, 1847, qualifies as spoiled and corrupt food (*comestible gâté et corrompu*) 'glandulous' flesh (*viandes glanduleuses*) offered for sale."

Gelle* also states that the flesh of animals affected with tubercular Phthisis in an advanced stage should be confiscated, and to judge by the statements of experts, his opinion is shared by many veterinary practitioners and experts in France and Belgium —Bouley, Verheyen, Dupont, Hugues, etc.†

France was the first to regulate the public abattoirs, and to organise a regular and convenient inspection of animal food. Napoleon I., by a decree of February 9th, 1810, suppressed private slaughter-houses in large and medium-sized towns, and ordered the establishment of public abattoirs. Article 3 of the Ordinance of April 15th, 1836, completed this primary measure, as by it, it was decided that the opening of a public abattoir in a given locality entailed the closure of every private slaughter-house therein.

* "Traité de Pathologie Bovine." Tome ii., p. 517.

† See also the "Bulletin de la Société Centrale de Médicine Vétérinaire," 1883, p. 14. Many British veterinary surgeons are of the same opinion. See the "Proceedings of the National Veterinary Congress," published in the VETERINARY JOURNAL for August (p. 126) and September (p. 209), 1883.—G. F.

Analogous arrangements were adopted in Belgium; there, at the same time, were instituted public abattoirs, and a well-organised inspection of meat, not only in the large towns, but also in some of the small ones.

In several of the large English cities there are similar establishments.

The scientific investigations with regard to the danger attending the consumption of flesh from diseased animals have never been suspended, although the effects of the alimentary products from tuberculous animals had not been specially inquired into. Since the end of the last century, investigations have been instituted as to the action of putrid meat and that which has been altered by disease. These investigations, which were in reality a continuation of those previously begun by Heim and Graumann, were continued during the first half of the present century. By them it was demonstrated that the ingestion of putrid flesh, as well as that derived from diseased animals, is not so dangerous as was supposed; and this demonstration caused several of the most distinguished *savants* to maintain that such food is not injurious, if it is previously properly cooked. Payen, for instance, says: "Positive facts demonstrate that raw flesh has no deleterious properties as food, even when it is in the first stages of fermentation, or when it is derived from animals affected with contagious or inoculable diseases (Anthrax), or those which are endemic; its dangerous properties disappear by boiling it. Thus, while condemning butchers, sausage-makers, etc., who sell the flesh of animals affected with disease, or putrid meat, the authorities should be assured that the accidental sale of such meat does not compromise the public health."

Renault, then director of the Alfort Veterinary School, at the conclusion of a long series of experimental researches commenced in 1828, asserted: "1. That there is no sanitary reason for prohibiting the feeding of pigs and poultry with the *débris* of knackeries, whatever this may be; 2. That there is no danger to mankind in eating the boiled milk or cooked flesh of animals—cows, oxen, pigs, sheep, or fowls—affected with contagious diseases, whatever may be the repugnance which these products may naturally inspire."

Other experimentalists have contested the legitimacy of these

conclusions, which were evidently too far-fetched; and the melancholy occurrences at Kloten, Switzerland, and elsewhere, have demonstrated in the clearest manner how well-founded these doubts were.

Thus it was that Verheyen, who nevertheless had known instances in which the flesh of diseased animals had been consumed with impunity, was of opinion that there was nothing to prove the innocuousness of such flesh when cooked. Recognising the, happily, infrequent cases in which the consumption of such flesh was followed, not only with serious accidents, but with death, the Belgian Academy of Medicine came to the following conclusions:—

"1. The flesh of healthy horses may be allowed to be sold as food without any inconvenience to the public health;

"2. Horses and other animals slaughtered for food, affected with inflammatory diseases in their early stage, may be so utilised, provided that the precaution is taken to have them bled to death;

"3. Animals attacked with Dropsy (*Cachexie aqueuse*), and *advanced Phthisis*, Small-pox, Measles (*Cysticercus cellulosus*), Rabies, and Glanders or Farcy, either acute or chronic, or Typhoid or Anthrax fevers, as well as poisoned animals, should be excluded from consumption."*

The latter opinion is now entertained by the great majority of *savants* and veterinary practitioners in central Europe.

Unfortunately, we do not know, or only imperfectly, the state of affairs existing in other countries, so that we cannot give a full notice with regard to the matter. The information which we have furnished will, nevertheless, suffice to show how much, on every side and during all time, attempts have been made to arrive at a competent *surveillance* with regard to the sale of flesh, and the articles of food manufactured from it, and particularly with a view to the preservation of mankind from the injurious influence of that derived from tuberculous cattle; this circumspection has had a tendency to increase in recent days.

* "Dictionnaire des Alterations et Falsifications des Substances Alimentaires," etc. Vol. ii., p. 513. Paris, 1855.

The Congress can only, then, confirm the decisions of similar assemblies which have preceded it, and in doing so respond to a general desire of governments, as well as local administrations, by accepting the following decision, which we respectfully submit to the members of this fourth international reunion.

It is of the greatest urgency that, in all the districts in which animals are sacrificed for human food, these animals should, before and after slaughter, be examined by a competent person, if possible a veterinary surgeon, whose duty it should be to seize all flesh which is injurious to the health of mankind.

With regard to *the special sanitary police measures in force against the use of flesh from tuberculous animals*, these exist in a more or less precise and categorical form in the South German States, as well as in Austria, Hungary, Belgium, Spain, France, Switzerland, and Italy. Such flesh is usually divided into three categories, according to the degree of alteration presented by the carcase; so that there is first-class or good flesh, second-class or inferior flesh, and flesh which is not allowed for consumption. The first is absolutely wholesome, and may be sold without restriction of any kind; the second can only be sold as food on certain conditions; and the last is not permitted to be sold, but is confiscated.

This classification, it must be admitted, is based only on a tradition which cannot be unconditionally accepted, and on the idea that lean meat full of morbid products should not be allowed for consumption, as it is not nutritive and causes disgust.

The reality of the danger resulting from the employment of alimentary matters derived from tuberculous cattle, has only had a scientific basis since the institution of Villemin's researches into the infectious nature of Tuberculosis; but it was Gerlach, director of the Berlin Veterinary School, who was the first to undertake really special investigations in this direction. He instituted experiments, those experiments on the action of suspected matters when ingested, to which allusion has been already made; and he ascertained that not only the ingestion of tubercular materials, but also that of *the flesh of tuberculous animals*, will often determine alterations of a tubercular and

caseous character in the animals experimented upon. He *usually* obtained this result if the matters or flesh were given in a *raw* state ; *rarely* if they had been previously cooked.

The experiments made by this *savant* satisfied him that the morbigenous principle of tubercle exists everywhere in the tubercle itself; that this principle may, at some point of the organism, be taken up by the lymphatic vessels, and by them be carried to a lymphatic gland, which in its turn becomes diseased. From this gland the nosogenous principle is gradually propagated to other parts of the body, as the pleura, for example; very frequently it is enkysted.

All these phenomena require for their completion, says Gerlach, a somewhat long interval, so that the flesh of tuberculous animals is not noxious at the commencement of the disease. During this period of the affection, the body of the diseased creature certainly contains the morbigenous virus of Tuberculosis, but only in certain limited situations which, in the majority of cases, can be recognised as diseased, this principle being fixed, it may be said, outside the flesh usually consumed as food, and in such small quantity that it can scarcely do any damage.

Gerlach was decidedly of opinion that flesh commenced to be hurtful when it can be demonstrated, by its persistent traces, *that Tuberculosis, starting from a limited tuberculous centre, has become more or less generalised throughout the organism.* As a proof of this propagation, he considers :—

"1. The existence of tuberculous lesions in the lymphatic glands in the vicinity of the organs which are the seat of tubercular neoplasies, and which may, in such cases, be looked upon as the point of origin or spread of the morbid infection ;

"2. The presence of caseous centres ; especially in the lungs, these centres indicating that they are already undergoing disintegration. The greater the number of these centres, the greater is the infective power and noxiousness of the flesh ;

"3. The secondary extension of the tubercles ;

"4. Evident emaciation."

(*To be continued.*)

Editorial.

THE FINANCIAL CONDITION OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

In this country the welfare of the veterinary profession, as a body, so largely depends upon the prosperous condition of the Royal College of Veterinary Surgeons, that we trust we may be pardoned if we venture to draw attention to a subject which has been occupying the minds of ourselves and others whose regard for everything that concerns animal medicine and surgery is not limited to the present, but extends to the distant future.

As is generally known, the Royal College subsists entirely upon the fees obtained from the examination of students, and these are on the same scale as when the Charter of Incorporation was granted forty years ago, though the examinations the students undergo have been trebled, and the expense attending these has been increased to an almost proportionate degree. Not only this, but the working expenses of the College, apart from examinations, have been gradually augmenting, until now they are far in excess of what they were ten years ago, and this augmentation is likely to go on. The secretarial duties have become much heavier than they were at the same period, and this necessitates an increase in the Secretary's salary; the correspondence forms a large item of expenditure; while the mode of election of Members of Council by voting papers entails an amount of labour and disbursement altogether unprovided for when the profession was incorporated—all which has to be met from the only source of income. Add to this the fact that the College should, and must, protect the profession from the inroads of impostors and unqualified men, and it will be readily understood that its financial condition is quite incompatible with the requirements imposed upon it. It is true that the lately-obtained charter empowers the Council of the College to raise the examination fees by a small sum, and this will have to be done immediately; but the addition to the income of the College from this source will effect but little good, as it is not unlikely that the Board of Examiners will be increased, and this will entail further expense. Seeing the benefit the profession derives from its corporate character and the improved management of its affairs, and knowing that every member has a great interest at stake in the Royal College, it would surely not be too much to expect that a small sum should be contributed annually by every one whose name is on its register—say ten shillings. In the course of a few years this contribution, if general, would make a great difference in the position and prospects of the College, and consequently in those of the profession itself. Without a museum, library, or even a home, it would almost seem as if members of the Royal College had no heart in their vocation, and no pride in its advancement. For a very small sum paid every year to a general fund every member would be giving the best evidence possible that he was not only desirous to assist in the best of all professional objects, but that he was appreciative

of the advantages he was receiving from the Royal College, and for which he now bestows nothing. Unless we are content to remain the worst-represented and least ambitious of all the professions, it is high time we were doing something for ourselves, and showing that we have a professional life and spirit. Apathy and selfishness on the part of individuals composing a profession react most prejudicially upon its progress and usefulness. We earnestly hope that the suggestion now offered may be accepted in a good spirit, and that we will soon be able to chronicle that a step has been taken in the right direction by the institution of an annual subscription to the Royal College by every registered member. Let us have something to be proud of; at present we have but little, if anything, to show that we are a profession and a corporation.

REPORT ON THE TRANSMISSIBILITY OF BOVINE TUBERCULOSIS THROUGH MILK TO YOUNG ANIMALS.*

BY FRANCIS IMLACH, M.D.

THE milk of three tuberculous cows was employed in these experiments. Four cows were purchased, but, as explained in a former report, one died in calving. There is good evidence that the "grape disease" rapidly increases when a cow is in calf, and that death after parturition, which is sometimes premature, is not uncommon. It is a habit with careless farmers to turn out their cows while they are yielding no milk on to the barest pasture, and to expose them night and day without shelter. The extension of the disease, and even its origin, is ascribed by many veterinary surgeons to this pernicious custom.

The first of the three cows was purchased on March 28th, 1883. It was six years old, and had calved probably six weeks or two months. It yielded four quarts of milk *per diem* for a month. After that, the supply gradually diminished, and had almost ceased on May 11th, when it was slaughtered. The milk was subjected to analysis both before and after purchase. At first, the milk did not seem to differ in composition from healthy milk, but towards the end of its life the total solids diminished, as may be seen from the following analysis, kindly made as a test by Dr. Campbell Brown, our city analyst. May 9th, specific gravity 1030; cream rose only 5 per cent., or about half the cream present; milk-globules small; fat, 3·9; other solids, 8·8, including sugar, 3·2, and ash, 0·66; total solids, 12·7. Bacilli were never detected in the milk. The rectal temperature was 100° Fahr. until ten days before it died, when it rose to 101·5°. The animal was plentifully fed, as were the others, with grains and long hay, and it always had a clean bed of straw. On *post-mortem* examination, bunches of "grape-like" masses were found on both parietal pleuræ. The lungs were much enlarged. Their edges were lined with the delicate red fringes so characteristic in bovine tubercle, and their surfaces were dotted with flat button-like processes. On section, also, they presented the usual condition in this disease; cavities with semi-solid cretaceous contents, cavities with cheesy contents, cavities filled with purulent matter, smooth-lined cavities containing fluid or cheesy substance (probably bronchiectatic), and miliary punctiform tubercle. Bacilli from this specimen were shown at the annual meeting of the Association in Liverpool, and were depicted by Messrs. Barron and Mott in their diagram of pathogenic organisms on that occasion. The bronchial

* From the *British Medical Journal*, for July 26th.

glands were enlarged, and so to a less extent were the mesenteric glands. The liver was healthy.

The second cow, aged 8 years, gave milk from June 8th to October 4th, when it was killed; three quarts *per diem* during June, four quarts during July and August, and three quarts in September and October. When examined *post-mortem*, the parietal pleuræ were healthy, but there were "grape-like" masses upon the apices of both lungs much larger than in the first specimen. The lower lobes of the lungs were comparatively healthy, but the upper lobes were riddled with cavities and groups of miliary tubercle. The bronchial and mesenteric glands were much enlarged. The milk of this cow remained uniform in composition throughout the period of observation. The following analysis, made before purchase, is a fair sample. June 6th, specific gravity 1029; cream rose 11 per cent.; fat 4 per cent.; other solids 9·9, of which sugar, 4·7, ash, ·78; total solids, 13·9. Fat-globules of ordinary dimensions.

The third one was a little French cow, seven years old, which gave seven quarts of milk *per diem* from the 17th of August, when it was purchased, to the end of September, and from five to three quarts until the end of October, when it was slaughtered. The milk was very rich in cream, and had a specific gravity of 1034. On August 31st, Dr. Campbell Brown's control-analysis gave: fat, 6·0; other solids, 10·55, including sugar, 3·68, and ash, 0·889; total solids, 16·55. In October, the total solids diminished to 12·5, but at no time was the milk a very poor one. The respirations were very hurried, but, as the temperature never rose above from 100·5° to 101°, it was doubted during life whether the cow was suffering from true tubercle. However, on *post-mortem* examination it became plain that this was the disease. The lungs were enormously enlarged, their surfaces were studded with button-like processes. On section, the lungs resembled those of the second cow. The parietal pleuræ were little affected. The pericardium, which is sometimes three inches thick in this disease, was also slightly affected; and, as in all cases I have examined, the bronchial and mesenteric glands were enlarged and numerous bacilli (most easily found in the glands) were detected.

Thus, in all three instances, mistake was satisfactorily avoided, thanks chiefly to the diagnostic powers of Mr. Reynolds, M.R.C.V.S., and Inspector Luya; but it must be noted that in none of them were the mammary glands obviously diseased. They were small and atrophied, but without sign of tubercle. It is evident that the presence of a mammary abscess would have vitiated the experiment. It is admitted that a syphilitic mother, with a specific lesion upon her breast, may transmit the disease to a suckling child; but, since the time of Hunter, it has been denied by almost all syphilographers that, without such lesion, Syphilis can be transmitted by the milk, and, conversely, that a mother having given birth to a syphilitic child, cannot become infected by nursing it (law of Colles). The innocuity of all physiological secretions, such as those of the salivary and lachrymal glands, has been firmly established by exact observation; and the experiments of Padova and Profeta have shown that even their inoculation is entirely ineffective. To have fed young animals on milk mingled with blood and pus would not have solved the problem whether the milk of tuberculous cows could transmit tubercle. Certainly the analogy of Syphilis would suggest the impossibility of such transmission, inasmuch as the infectiousness of this disease is more surely established than that of tubercle; but the experimental feeding of young animals by Gerlach of Hanover, Münch of Strasburg, and Bollinger of Munich, seemed to show that this analogy did not hold good; and the results obtained by Orth, Chauveau, and others, when young animals were fed with the flesh, lungs, glands, etc., of tubercu-

lous cattle, appeared to strengthen this conclusion. Dr. Creighton, in his able work on "Bovine Tuberculosis," has attempted to show that the bovine form of tubercle may be detected in man by pathological examination alone, and without inquiry as to whether the milk of diseased cows has been drunk. He alludes to fifteen patients who died, he believes, of this disease in Addenbrooke's Hospital, during a period of only seven months. It need be no matter of surprise, though it may be fit cause for alarm, that so many cases should occur in one small hospital in so short a time; for Tuberculosis luxuriates among cattle, and grows in large tumours and excrescences, compared with which human Tuberculosis is a degenerate disease; and it is extremely common. Statistics of its frequence in this country have not been obtained, but all veterinary authorities appear to agree with Mr. George Fleming, who says (the VETERINARY JOURNAL, May, 1880, p. 313): "Our dairy-stock are probably largely infected, and, among high-bred cattle, it is not only prevalent, but, from what I can learn, is on the increase." From October 2nd, 1882, to March 13th, a period of five and a half months, Inspector Luya, chief inspector for this district of cattle and meat, kept notes of all the cases of tubercle he met, chiefly with reference to the age at which they were killed, the district from which they came, and the organs most affected. These cases numbered 168. These were not all, but nearly all that were slaughtered in the various abattoirs in Liverpool. The accompanying table shows the age of the animals in years.

Age of Tuberculous Cattle Slaughtered in Liverpool during 5½ months.

Under 1 year	1	2	3	4	5	6	7	8	9	10
1	2	3	5	17	32	46	35	14	7	6

The districts from which they were brought were as follows :—

From Liverpool	75	cases.
„ dense suburbs, as Bootle, Walton, etc. ...	26	„
„ other parts of Lancashire	22	„
„ Cheshire	20	„
„ Ireland	18	„
„ Wales	4	„
„ Westmoreland	2	„

As to the organs affected, only rough notes were made. In all, the lungs and pleuræ were affected, in eight the pericardium, in seven the liver, and in one the liver and kidneys were also affected. Now, without more figures, it is sufficiently evident that, in the first place, most of the cases come from town shippens in dense districts, and that while tubercle is very rare among calves, it occurs most frequently in cattle between four and seven years old. It may be taken for granted that a large amount of the milk supplied from town shippens comes from tuberculous cows, and that if, indeed, tubercle can be as readily and surely transmitted to human beings by the consumption of such milk as it was transmitted to calves, young pigs, puppies, goats, etc., in the experiments of Gerlach and others, then the chief factor in the production and maintenance of Phthisis in man has been discovered. But, on the other hand, the extreme rarity of the disease in calves suggests the possibility of some fallacy on the part of the experimenters. Their results seemed to show that tubercle may be produced in calves, goats, pigs, etc., by the ingestion of milk, with almost as much certainty, and in as short a time, as is required after inoculation with the cultivated bacillus. Thus Gerlach

found tubercle to have become developed in a young pig after it had been fed only twelve days with such milk. Though tubercle is almost unknown in the pig, fringed pleuræ and grey-coloured nodules in the lung were seen at the *post-mortem* examination one month after the milk-feeding had ceased.

My own observations have been confined to this question; namely, whether, as has been alleged, tubercle is surely, or even sometimes, produced in young animals by feeding them with the milk of "graped cows" during a short period of time. The cows were kept in a stable, the young animals in a coach-house, and a harness-room between served to cut off communication. Great care, involving much time and trouble, was taken to secure proper ventilation, due warmth, and thorough cleanliness.

Calves.—On April 15th, a healthy male calf, one week old, was purchased. To May 11th it was fed upon three quarts daily of the milk yielded by the first cow, and to July 14th upon three quarts from the second cow. In addition, it was fed at other meals, as were all the calves, with oatmeal boiled for an hour in water, with sweet milk from a healthy cow added. On July 14th it died, after having been fed with tuberculous cows' milk for eighty days. The *post-mortem* examination was made in the presence of the committee who have co-operated with me in this investigation, namely, Dr. Waters, Dr. Davidson, and Dr. Caton. There was no appearance of tubercle in the lungs, pleuræ, liver, kidneys, glands, or other organs. There was some congestion of the small intestine, which was the apparent cause of death. Besides these conditions, however, there were a few small nodules, about the size of a pea, scattered over the mesentery. These had not the look of tuberculous nodules, as ordinarily seen in mature cows. They were handed over to Dr. Mott for microscopical investigation, but he has been unable to detect the bacilli of tubercle in any one of them.

A second calf was purchased immediately after the death of the first, and, on August 17th, a third one. Both were a fortnight old when bought, and the parents of both were known to be healthy strong animals. Each got two quarts of milk from the second and third cows until they were slaughtered at the end of October. One, therefore, was fed for eighty-three days, and the other for sixty days. They were in prime condition, and nothing abnormal was discovered by the most careful *post-mortem* observation.

Pigs.—On June 27th, two young pigs were selected from a healthy litter of a month old. Each got a quart of milk daily from the tuberculous cows, and were otherwise liberally fed until August 20th. They were then placed upon a country farm, where they were well cared for. On August 21st, two other sucking-pigs were substituted for them, and got from one to two quarts of the milk of the tuberculous cows until the end of October. Then all four pigs were slaughtered. Their condition was much admired at the abattoir, and the *post-mortem* results were entirely negative.

Goat.—On June 11th, a goat was bought, of unknown age, but too old to be called a kid. It got what little spare milk there was, an unmeasured quantity. At the end of October, its lungs and other viscera were entirely free from tubercle.

Monkeys.—On March 29th, two young monkeys recently landed in Liverpool were purchased. One was fed on bread soaked in the milk of all the three cows in succession. The other was fed similarly with bread soaked in milk from a healthy cow. In the beginning of June, another young monkey was procured, and fed like the first. In addition, they got dates, apples, nuts, etc. The control-monkey died one cold night after having been kept five weeks. Its lungs were congested, but there was no tubercle. At the end of October, the two remaining monkeys, miserably ill, were killed. The lungs of both were riddled with tuberculous cavities. Their livers, also, were studded with purulent cavities, and their mesenteric glands were enlarged.

Guinea-pigs.—Four guinea-pigs, kept as control-animals throughout the observations, remained healthy at the end of them. In July, eight young guinea-pigs were fed for a month on bread soaked in the milk. In October, they were killed, and found to be free from tubercle. In September, six others were similarly fed. In December, being then in a damp cold yard, three of them died, and the remainder were killed. None of them exhibited the well-known signs of Tuberculosis in the guinea-pig. It should be understood that to the end of October they were all kept in dry warm quarters.

It may be fairly concluded from these observations that healthy young animals, carefully selected and tended, may be safely fed with the milk of tuberculous cows without the rapid development of Tuberculosis. Only in the two monkeys was there evidence of tubercle, and the disease is too common amongst them in this country to allow us to ascribe its development to infection by milk. Of the ultimate results of such feeding it would be unsafe to make any assertion, for extensive observations would be necessary in order to avoid numerous obvious fallacies. The investigations carried on in Berlin under the superintendence of Virchow having left this question unsettled, it would be a great boon to the medical profession if Mr. George Fleming, who has so ably and so forcibly drawn attention to it, or some other veterinary authority with facilities and skill superior to what any member of our profession can be expected to have, would subject this great problem to a practical test.

In Vienna, New York, and elsewhere, efforts have recently been made to suppress the sale of milk from tuberculous cows by legal enactment. Though the observations above recorded do not suggest that a healthy child in a comfortable home would be hurt by the occasional ingestion of such milk, it would be rash to conclude, without further observations, that tubercle might not thus be engendered in an ill-fed and ill-clad child with an unhealthy heritage and a digestive mucous membrane eroded by frequent diarrhœa.

REPORTS OF THE GERMAN IMPERIAL BOARD OF HEALTH.*

THE paper that follows next to Koch's (already noticed in the Journal) is a most elaborate statistical essay on the mortality from Phthisis in relation to age and sex. The figures are compiled from many quarters, and are handled in a very exhaustive way. The author, Dr. Würzburg, formulates but few conclusions, such as that throughout the Prussian States, whether in town or country, the mortality which is great in infancy falls to a minimum between five and ten years, and then rises in regular manner to the age of sixty to seventy, when it reaches a maximum. Similar results obtain in the United States and in Sweden, but England shows an exception to this rule. The mortality in Prussia and Sweden is greater amongst males; in England and the United States among females. It is higher in towns than in the country. In Prussia many variations of the relative mortality in Phthisis occur in regard to locality; thus the mortality in the Eastern States is less than that of the Western.

Dr. Gaffky's article upon the occurrence of Tubercle Bacilli in the Expectoration is based on observations carried on in Fraentzel's wards in La Charité, in connection with experiments on the effects of inhalation treatment.

* Reports of the Imperial Board of Health. Edited by Dr. Struck, Director. Second Volume. (Mittheilungen aus dem Kaiserlichen Gesundheitsamte. Herausgegeben von Dr. Struck, Geheimen Ober-Regierungsrathe, Director des Kaiserlichen Gesundheitsamtes. Zweiter Band.) Berlin: Hirschwald, 1884. —*The Lancet.*

He has drawn up, in a tabular form, the results of the examinations which were made daily in fourteen cases, more or less advanced. The total number of examinations was 982, and bacilli were only absent on forty-four occasions. The number of bacilli varied very much ; but he refrains from drawing any prognostic conclusions, owing to the comparatively small number of cases examined.

Then follows an account by Drs. Ernst Schill and Bernard Fischer of their experiments on the Disinfection of Phthisical Sputa. They point out that the sputum contains the spore-bearing bacilli, and that the more resistant power of the spores renders the sputum liable to retain its infective properties, especially in the dried state, under many adverse conditions. The germicidal agents employed were the action of heat, dry and moist, boiling, exposure to the action of corrosive sublimate, alcohol, carbolic acid, sal ammoniac, common salt, arsenious acid, iodide of potassium, iodoform, and aniline water. Sputum which had been dried and kept for a variable time as well as recent sputum were severally treated, and the test of the retention or not of infective qualities rested on the results of inoculation experiments with the sputum so treated compared with the results of control experiments with the unaltered sputum. The general result of this extensive inquiry may be summed up as proving that subjection to high temperatures and actual "cooking" destroys the virulence ; that corrosive sublimate and alcohol are far less efficient than carbolic acid, for exposure of the sputum for twenty-four hours to a 5 per cent. solution of the latter suffices to render it innocuous. Aniline has the same property, but it requires to be employed in far larger bulk ; and therefore, not only in the matter of exposure, but also the disagreeable odour of aniline and its highly poisonous character, render it far less applicable for general disinfection than carbolic acid.

The subject of anthrax inoculation and the protection afforded by the use of attenuated virus against the spontaneous disease form the basis of researches by Drs. Koch, Gaffky, and Loeffler, in continuation of those recorded in the first volume of these reports. After reviewing the various methods of attenuation, of which Pasteur's cultivation method is the chief, these writers point out that the commonest mode of entrance of the virus is by way of the digestive tract, and that it was therefore incumbent on them to test the value of inoculation on animals who had thus ingested the virus. They found that by feeding animals with anthrax spores infection followed as rapidly as after subcutaneous injection, provided that the dose was sufficiently large ; but that in many cases immunity was not conferred by inoculation against the disease arising from feeding. Such a result may explain the failure of "anthrax-vaccination" to afford absolute immunity, for although a vaccinated animal may be proof against inoculation, it may yet succumb to the virus taken into the alimentary canal.

The paper read by Dr. Hesse on the Quantitative Estimation of Micro-organisms in the Air is an example of an interesting mode of research patiently conducted. By means of suitable apparatus air was drawn through tubes coated internally with glycerine, and the development of colonies of fungi and bacteria at different parts of the tube carefully observed, the time noted at which they appeared, and their disposition at various parts of the tube under varying atmospheric conditions of locality, season, and climate. The subject is one which is worthy of further inquiry ; and as the method is simple, we may hope to find it followed up by others. Some excellent chromo-lithographs depicting the masses of fungous growth in the tubes illustrate this essay.

Dr. Schutz contributes a paper upon the Entrance of Fungus-spores into the Air-passages, and the Lung Disease (pneumono-mycosis aspergillina) thereby occasioned. The paper opens with a copious historical sketch of

such "mycosis" described in man and animals, and then proceeds to relate the author's personal observations upon one such affection that occurred as a fatal epidemic in a flock of geese. The lungs of the first bird examined were the seat of firm greyish-red and small greyish-yellow nodules; whilst the air-passages were filled with muco-purulent secretion. The inner surface of the air-sacs, especially the abdominal one, was coated by a greenish delicate fibrinous layer. Another bird, whose symptoms were obviously respiratory, presented cavities in the lungs containing fungus-mycelium, which was also met with in the air-sacs. Small portions of the fungus were cultivated, and it was determined to be the aspergillus fumigatus. Details are then given of experiments by feeding and inhalation, resulting in the growth of the fungus within the birds thus treated; and these results are contrasted with similar experiments with the aspergillus glaucus, which were negative. The paper concludes with references in literature to the occurrence of fungi in diseased lungs in man, mostly regarded hitherto as merely accidental concomitants. The suggestion that some of these cases may be true "mycoses" is plausible. A short description is also given of the fungus of tinea Galli, and its cultivation in nutrient fluids and gelatine.

Then follows a very elaborate report, by Drs. Fischer and Proskener, upon chlorine and bromine as disinfectants. It is not possible to analyse this in detail here; suffice it to say that the experiments are based upon the subjection of a very large number of various kinds of micro-organisms to the vapours of these substances. As to chlorine, a valuable disinfectant most appropriately used under certain circumstances, it is much to be preferred to sulphurous acid, which is far less effective. The chlorine should be concentrated, and it is calculated that the cost of materials is about fifteen pfennigs per cubic metre of the gas. It is also essential for thorough disinfection that the air be laden with moisture, and the room to be disinfected be exposed to the gas for some twenty-four hours. The great objection to chlorine is its inapplicability to the disinfection of clothing and other fabrics. Bromine gives good results, but is even more detrimental to fabrics, besides being more costly than chlorine.

Reserving for future notice Dr. Hueppe's article on Lactic Fermentation and that by Dr. Loeffler on Diphtheria, we may conclude this article with a review of the interesting contribution of Dr. Gaffky on the Etiology of Typhoid Fever. It opens, like all these reports, with a concise history of previous research after specific organisms in this disease, amongst which the observations of Eberth, Meyer, Klebs, and Koch are the chief, each of them, too, claiming to have determined the presence of a bacillus. Dr. Gaffky's research is based on a microscopical examination of the organs from twenty-eight cases. The detection of a bacillus seems to depend somewhat on the stage of the disease. In the intestine, it is easiest in the stage of infiltration, but when ulceration is in progress the liability to confusion from the presence of putrefactive bacteria is great. However, the spleen, liver, kidneys, and mesenteric glands also harbour the bacillus, and its presence in one or other of these organs is conclusive. The mode of preparation is to immerse the sections of the organs (which have been hardened in alcohol) for twenty-four hours in a saturated aqueous solution of methyl-blue, then wash them in alcohol, and having cleared them with oil of turpentine, to mount them in Canada balsam. In only two out of the twenty-eight cases were no bacilli found in these organs, and in one of these cases they were met with in an intestinal ulcer, the other case being one of perforation at the end of the fourth week. He also alludes to two other cases not included in the above, one in which death occurred after the intestinal ulcers were healed, and the other which presented the clinical and anatomical features of typhoid, and was fatal in the third week. In this case micrococci were found in abundance, but no

bacilli. The bacillus is in length about one-third the diameter of a red blood corpuscle, and is three times as long as it is broad. It often exhibits spores, and it is found in the infiltrated follicular glands, in the spleen, liver, kidney, and mesenteric glands, as well as more sparsely in the lungs. It can be cultivated outside the body, hitherto without much success, probably from imperfection of methods, and especially from experimenters not taking care to isolate the organism previously. Gaffky has made many pure "cultures," and is satisfied that this bacillus is distinct from other pathogenic forms. It is motile; does not stain well with aniline; in gelatine it does not tend to spread, and never causes liquefaction, as so many of these bacteria do; its colonies have a yellowish colour. It can also be cultivated on the surface of boiled potato, and in sterilised blood serum, showing definite macroscopic characters. Attempts to cultivate it from the stools failed, because of the interference of the other bacteria in these ejecta. Nor did he succeed in cultivating it from the blood of typhoid patients. The question whether Typhoid Fever can be transmitted to the lower animals has long been the subject of experimental inquiry, and almost invariably the result has been negative. It might be thought that by the use of these cultures as the inoculating agents greater chance of such transmission was afforded; but Gaffky experimented, by inoculation and feeding, on monkeys, guinea-pigs, rats, mice, rabbits, and other animals without once producing typhoid lesions. A calf fed repeatedly with the cultivated bacilli, and killed six weeks after the last infection, presented not the slightest trace of intestinal affection. These failures are not held to disprove the etiological importance of the bacillus, which was not found by Eberth in twelve cases of intestinal Tuberculosis, and the occurrence of which in such large abundance in the intestines in the earlier stages of Typhoid Fever is suggestive. It is contended that the evidence is not weaker than that afforded by Leprosy and Relapsing Fever; in all these diseases there is the presence in the blood or tissues of an organism having special characteristics, and not found in any other disease; but as yet in neither has the causal connection been proved; whereas in Splenic Fever, Tuberculosis, Glanders, and Erysipelas, the specific micro-organisms have been experimentally shown to be capable of exciting the characteristic lesions. Are then, he asks, the typhoid bacilli to be regarded as specific pathogenic organisms? He is decidedly of opinion that they are; and he shows how the study of the characters of the bacillus, and the analogies of other diseases, afford no ground for believing that this bacillus can be evolved from non-pathogenic putrefactive bacteria. Since the lower animals resist infection, it is not possible to say whether the virus can be artificially attenuated; but the notorious variations in severity of epidemics point to this as a possibility. It is likely that outside the body the typhoid germ may long remain in the form of "resting spores," but it is also probable that under certain conditions they multiply and develop as the anthrax bacillus does apart from the intervention of the human organism. In discussing their mode of entrance into the human body, he points out that the main body of evidence favours their introduction into the alimentary canal, mainly through the medium of drinking water, but also by contaminated food, and by the inhalation (into the mouth) of dust carrying the germs. It is not, however, quite possible to exclude inhalation into the lungs. Appended to this paper is a description of an epidemic of Typhoid in a garrison at Wittenberg in 1882, where the source of infection was clearly traced to contamination of the water-supply.

OBSERVATIONS ON RICKETS, ETC., IN WILD ANIMALS

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IN the year 1650 a small book was published in London entitled, "A Treatise of the Rickets : being a Disease Common to Children. Published in Latin by Francis Glisson, George Bate, and Ahasuerus Regmorter, Doctors in Physick and Fellows of the Colledg. of Physitians at London."

This was the first systematic account of a disease which, in its usual form, does not require any skill to recognise, and is unfortunately so common that an ordinary schoolboy is familiar with the term, the name "Rickets" being a byword.

Since the date of Glisson's book (which passed into a third edition), Rickets has been ably investigated clinically, pathologically, and experimentally by very many observers up to the present time, and a long list of monographs, dissertations, lectures, and papers by distinguished authors has been devoted to the elucidation of its pathology and the best means of treatment. Therefore it seems a little strange more attention has not been devoted to this malady in animals. That domestic animals and wild beasts in captivity suffer from Rickets was certainly known is attested by the fact that the Museum of the Royal College of Surgeons, London, possesses specimens exemplifying the condition of the skeleton affected by Rickets, as it occurs in lions, cats, and monkeys, several of the preparations being marked "Hunterian." The "Proceedings of the Zoological Society, for 1845," contain a paper by Professor Percy, in which is mentioned the death of certain monkeys from an affection of the skeleton resembling *Mollities ossium*.

Otto, writing in 1830, states that Rickets usually occurs in the early period of youth in man and animals. He had observed it in puppies, calves, lambs, and young monkeys. Examples are given by Sandifort (*Mus. Anat.*, vol. iii.), from the monkey, dog, and porcupine.

Later on Otto speaks also of *brittleness* of bone, a diminished consistence, which may occur in early youth, but generally only in advanced age ; it also occurs in animals, he having noticed a great degree of brittleness in several monkeys, in a hyæna, in a two-year-old lioness, in some dogs, stags, and roes.

This same writer speaks of a softening of bone which occurs in adults and old people ; this is especially called *osteomalacia*, *rachitis adultorum* and *senilis*. It is much more common in the female than in the male sex. It was found in the horse, ox, sheep, dog, cat, rat, in very many monkeys, and one polar bear. In the birds the disease appears to be more rare.

In the debate on Rickets at the Pathological Society, in the session of 1881, Dr. Crisp mentions the occurrence of the affection in birds, wild and domesticated animals.

Dr. Murie, who formerly held the appointment of prosector to the Zoological Society, was aware that many of the animals dissected by him exhibited marked rickety changes in the bones ; but that Rickets was as common, or even more frequent, among wild animals in captivity than among children, was never in the least suspected ; indeed, so far as can be learned, no one had investigated the subject with the care and attention it deserved.

Some three years ago the author of this paper was appointed (as one of the Committee of Comparative Pathology) to make *post-mortem* examinations upon the animals dying in the Zoological Gardens in Regent's Park, and to show at the Pathological Society such specimens which came to hand of pathological interest. The result has been, that during the sessions of 1882, 1883, and 1884 several papers have been contributed on the subject of

Rickets in wild animals, which go to show that it is an affection of astonishing frequency, and a very common cause of death among wild animals in the captive state. Many opportunities, and so much material, have come under notice as to enable a fairly complete and comprehensive description to be written of this singular disease as it occurs in animals.

Before proceeding to discuss the subject in detail, it will be well to give an account of some of the difficulties which arose in the early part of the investigation. The first specimens shown at the Pathological Society, and described in the "Transactions" for 1883, were from monkeys, the great defect in the communications being the inability to ascribe any definite age to the patients. All this uncertainty depended on the fact that the Quadrumana rarely reproduce in the gardens; if they do bring forth young, the offspring rarely survive; and so little reliable information as to the age of the monkeys was forthcoming, even from those who were in a position the most likely to afford evidence on this point, that for a time the inquiry was much hindered.

Finding it almost impossible to satisfactorily settle the question within reasonable time, attention was directed to another group of animals which do occasionally breed in confinement and whose young survive. The smaller Carnivora have fulfilled the required conditions, and reliable indications may be given to determine certain curious and interesting features in the course of the disease, which, for a time, were somewhat obscure.

A mammal from birth to maturity passes through an intermediate stage, viz., that of puberty, and we have in consequence three very definite periods, —1, infancy; 2, puberty; 3, maturity. In animals the stage of infancy corresponds to the development of the chief secondary centres of the long bones, such as the condyles of the femora, the heads of the tibiæ and humeri, the extremities of the radii, ulnæ, etc.

As infancy yields to puberty, the terminal caps of cartilage belonging to the limb bones, although separated from their shafts by the thin epiphysial cartilages, are nevertheless thoroughly ossified, only the smaller insignificant epiphyses retain the cartilaginous condition. Now, changes are obvious in the vertebræ; the complementary centres for the processes and epiphysial plates of the centra make their appearance, and the spinal column becomes the seat of active change and growth. In infancy the *appendicular* skeleton is undergoing rapid changes, whereas at puberty the activity becomes transferred to the *axial* skeleton.

If an animal of uncertain age falls into one's hand, the age may be determined for pathological purposes by the following test:—

1. If no epiphysial lines be detected, either in the spine or appendicular skeleton, the animal is thoroughly adult; often degrees of maturity may be estimated by the condition of the cranial sutures.

2. If the complementary plates of the vertebræ remain distinct, the epiphyses of the long bones not fused with the shafts, and many of the smaller epiphysial centres only just appearing, the animal must be considered as in the period of puberty.

3. No secondary centres in vertebræ, and those in the long bones small, the animal must be regarded as an infant.

That some such rules as these are absolutely necessary to guide one, is illustrated by the facts that some animals attain puberty in a few months (certain rodents), while others require two years for the complete growth of the skeleton, and many larger animals several years. It has been stated that—knowing the age at which the lower epiphysis of the radius unites completely with the shaft, and multiply the time occupied by four—the result represents the average age of the animal.

The rule is only applicable within wide limits, nevertheless it is exceedingly useful as affording at least an approximate estimate of the duration of life

for any particular animal. As the symptoms, pathological appearances, and distribution of the lesions vary with the age of the animal affected with Rickets, it is necessary to divide the subject and describe the disease in three forms :—

(1) Rickets of infancy, (2) of puberty, and (3) of maturity.

Although typical cases belonging to each period will be described, nevertheless instances, as would reasonably be expected, occur at intermediate ages, in which the skeletons present conditions exactly midway between any two forms corresponding with the creature's age. As in matters of natural history, so in pathology. Nature is ever ready to break down the barriers of hard-and-fast systems of classification ; and though lines of demarcation are often essential to mark culminating points, at most they are always to be regarded as arbitrary arrangements.

Rickets of Infancy.

Symptoms.—The clinical aspect of the disease has been chiefly followed out in monkeys. When one of these creatures becomes affected with Rickets it is less lively than usual. Instead of leaping from bough to bough, fighting, or otherwise displaying evidence of agility, the monkey grovels about on the floor, and, if pushed, shrieks as though the movement caused pain. By degrees the power of locomotion becomes considerably impaired, the creature displaying signs of paralysis in the lower limbs, finally ending in paraplegia, accompanied with priapism, incontinence of urine and fæces. The mode of progression is now characteristic. The hinder portion of the body being paralysed, the monkey is obliged to use the long fore limbs as crutches, and swing the trunk between them. At this stage deformity of the chest is obvious. A well-marked kyphotic curve of the spine is established in severe cases, and the creature presents a very pitiable condition. A sudden change in the weather, or exposure to a draught of cold air, sets up a slight attack of Bronchitis, and as sure as a rickety monkey develops a cough, be it even a slight one, the animal soon succumbs. Such opportunities as have occurred for watching the course of the disease in other animals, *e.g.*, carnivora and rodentia, give similar effects.

The disease develops with remarkable rapidity. I have seen a Capuchin monkey in good health, and apparently thriving well, die horribly deformed, in consequence of Rickets, four months after.

Morbid Anatomy.—At the autopsy the most noticeable features are the deformity, particularly the kyphotic curve of the spine, which, in some cases, is so pronounced that the symphysis pubis and xiphoid cartilage almost touch one another.

The sinking in of the thorax in many cases is so great that the costal cartilages of opposite sides approach one another so as almost to come into apposition ; indeed, this would often happen but for the heart being pushed forwards and occupying the interspace.

The chief visceral lesions are connected with the lungs, heart, and liver, but only the lungs exhibit any constant lesions.

1. *Lungs.*—In nearly all cases of Rickets occurring at the period of infancy, when the ribs are soft and yielding, the lungs present a condition of atelectasis ; so extreme is the collapse in some cases that it is hard to imagine how the animals managed to breathe. In certain specimens Broncho-pneumonia may be detected, and these two affections, complicating Rickets together or separately, kill the majority of monkeys brought to this country.

2. *The Heart.*—As before explained, the heart often gets compressed between the yielding thoracic parietes and pushed forward against the sternum. Thus in the movements of the chest walls during respiration, friction is set up between the two layers of the pericardium. The consequence of

this attrition is, that a "milk-white patch" develops on that portion of the heart subjected to the rubbing, whether it be auricle or ventricle, and on one occasion the "patch" was situated on the superior vena cava.

3. All animals living in confinement for any considerable length of time become possessed of fatty livers, so that its occurrence in Rickets does not excite surprise.

4. During the examination of more than two hundred rickety monkeys, only twice has the spleen been found enlarged; in these two instances it was about twice as large as usual, with a hard resisting feel and a thickened capsule.

5. In many cases the stomach is dilated, being often twice or thrice as large as in its normal condition.

6. *The Spinal Cord.*—In animals which have exhibited during life symptoms of paraplegia, the cord in the lumbar region is found to be compressed by a narrowing of the bony canal in which it lies. The cause of this will be explained fully later on. When the compressed cord is subjected to microscopical examination the most obvious changes are these:—

The nerve tubules near the periphery look as though the medullary sheaths were removed, and in many places the axis cylinders are destroyed also; nearer the grey matter the axis cylinders may be detected; fatty granules are abundant; the grey matter contains few, in some places no nerve-cells, and such as remain are distorted and compressed; in fact, the structure of the cord is thoroughly disorganised.

The gross morbid anatomy of the skeleton will now be considered, commencing with the AXIAL SKELETON.

1. *The Thorax.*—The bony framework presents the well-known deformity "pigeon breast," presenting in its details those features characteristic of the same condition, so familiar to all physicians, in young children, subjects of well-marked Rickets. As before mentioned, in severe cases the yielding of the ribs takes place to such an extreme degree that the costal cartilages of opposite sides come almost into contact. It is this compression of the thorax by atmospheric pressure, hampering the lungs and causing them to collapse, that makes Rickets such a formidable disease, so far as life is concerned.

Large beads form at the junctions of the rib-shafts with the costal cartilages, the enlargement being confined to the rib itself, and most obvious on the pleural aspect of the thorax.

Very often a double series of rickety beads may be found on each side, this second row being situated near the angles of the ribs. These adventitious swellings result from infractions, that is, the ribs are so bent in at the anterior portion of the chest that the ribs near the angles are fractured, but the periosteum remains intact, at least in the majority of the cases. The movement of the broken bones in respiration causes a large amount of thickening, due to provisional callus, leading to the bulgings in question. In the most exaggerated example of Rickets which came under my notice, a Macaque monkey, seventy-six "infractions" were counted on the ribs alone.

In a few specimens of rickety monkeys the chest has exhibited a deformity in the opposite direction; instead of being laterally compressed, the sternum is bent upon itself at an obtuse angle, as though the xiphoid cartilage and the manubrium were endeavouring to meet. In these cases the lateral measurement is increased, the antero-posterior and vertical diameters are diminished. This is caused by the high degree of kyphotic curvature tending to make the symphysis pubis and costal arch approach one another, thus narrowing the space for the abdominal viscera; at the same time the stomach undergoes dilatation and pushes up the ensiform cartilage. The condition is peculiar to monkeys. Carnivora and Rodentia suffer, so far as I have

examined specimens only from the lateral compressions, but they frequently exhibit "infractions" of the ribs.

The Skull.—Phenomena of interest and importance occur in this part of the skeleton. As a rule the bones are so soft that they may be cut with an ordinary knife, and repeatedly have I split the skull as easily as though it were made of gutta percha. The bones of the cranial vault are usually slightly thickened and spongy, often presenting a worm-eaten appearance on their exterior.

The bones forming the base of the skull undergo a peculiar process of thinning known as craniotabes. This condition most frequently attacks that part of the squamo-occipital bone which lies below the curved lines, and is of cartilage origin; in some instances the cerebellar fossæ on either side of the foramen magnum are so thin as to creak under the finger like parchment, and in certain instances actual perforations occur. Tabetic patches exist at times over the orbits.

The singular contrast of the effects of this disease on the skull cannot fail to arrest attention; bones of membranous origin thicken somewhat, whereas those performed in cartilage show thinning. The teeth are, as a rule, normal in number and in size; but these structures will be more fully considered later on.

The Vertebral Column.—It has been known for several years that very many monkeys die paraplegic, but the cause of this symptom has never been fully worked out until recently. In addition to the kyphotic curve presented by the spine, the individual vertebræ become exceedingly soft, indeed so soft that in conducting *post-mortem* examinations, the bodies of the vertebræ may be cut through as easily as the intervening fibro-cartilaginous discs. Consequently, when the animal stands, the pressure of the superincumbent weight causes the softened vertebræ to yield and press upon the cord in its canal, and to injuriously compress the spinal nerves as they issue from the intervertebral foramina. In addition to the actual softening and bulging of the bones, a layer of ossific matter is deposited on the interior of the canal; this in its turn tends to narrow the usual ample space allowed for the cord and its membranes.

That the nerves do get squeezed may be illustrated in this manner. If a monkey just showing signs of paralysis be made to stand up, it shrieks in a frightful manner in consequence of pain due to pressure, and when manipulated evidence of pain may be observed.

THE APPENDICULAR SKELETON.—1. *Upper Limb.*—The clavicle is usually thickened, especially at the sternal end.

The scapula is soft and spongy, allowing the serratus magnus and subscapularis muscles to invert the posterior border.

The humerus, radius, and ulna soften, their shafts thicken and their epiphyses are often twice or thrice the normal size. The medullary cavity is large and filled with red, vascular medulla. The most distinctive signs are to be found at the epiphysial junctions, where, replacing the thin, narrow streak of hyaline cartilage, a band of tissue is seen, frequently five, and in some cases ten, millimetres in thickness, the increased breadth being due to a substance named by Guérin spongioid tissue. The lower epiphysis of the radius and the head of the humerus are the seats of the greatest change in the upper limb. The carpal and metacarpal bones share in the general disturbance. The long bones, in addition to the changes above described, undergo abnormal curving in the direction of their length, but these softened bones rarely break.

The periosteum of the long bones is thick, succulent, and easily separable from the shaft.

2. *The Lower Limb.*—With the exception of the changes connected with

the pelvis, the description of the upper limb would apply to the bones of the lower extremities, viz., thickened periosteum, curved shafts, enlarged epiphyses, irregular growing lines, softened texture, and increased vascularity. The changes are most obvious in the lower ends of the femur and tibia. The condyles of the femur I use as my test. If Rickets be suspected, an examination of the lower epiphysis of the femur will either confirm or disprove the suspicion.

The pelvic changes are important on account of the narrowing of the diameters of the cavity of the true pelvis, presenting an obstacle to the effectual expulsion of a living offspring. It seems that a relative narrowing takes place chiefly in an antero-posterior direction in addition to an absolute shortening of the measurements in all the diameters. The action of the muscles on the crests of the ilia in severe cases causes inversion of their margins.

The histology of the affected tissues must next be considered.

Histology.—Briefly, the changes met with in rickety bones may be summed up thus :--they are an exaggeration of the processes normally concerned in the formation and growth of bone. As bones increase in length at the epiphysial cartilages, and in width or thickness by a deposition of matter from the deeper layers of the periosteum investing the diaphysis, these tissues are the ones chiefly concerned.

On making a vertical section through a healthy long bone (the femur is the best and most convenient bone to select) taken from a young animal, we find at either end a certain portion of the shaft segmented off by a very thin but distinct and regular line of hyaline cartilage, usually one millimetre in thickness. If the tissue at this spot be submitted to the microscope it will be found that this apparently homogeneous line of cartilage presents *two* very distinct zones. The one farthest from the bone-shaft exhibits the characteristic appearance of normal hyaline cartilage, the second, in immediate proximity to the growing bone, displays cartilage cells arranged in tiers of about six, eight, or ten, each column being separated from its fellow by a spiculum of calcareous matter. This arrangement extends the whole breadth of the epiphysial cartilage, so that in section these cellular columns are arranged as regularly as a phalanx of soldiers, and present a characteristic picture.

In Rickets all this is exaggerated ; a section through the epiphysis shows the line of cartilage to be several millimetres thick, instead of one ; between this and the bone is a layer of variable thickness, formed of a peculiar gelatinous tissue known as the " spongioid tissue " of Guérin, possessing a bluish, translucent appearance. Examination with a microscope shows *three* zones, viz. :—

1. A layer of normal hyaline cartilage exceeding many times its healthy thickness.

2. The layer of cells arranged in vertical columns, but consisting not of ten or twelve superimposed cells, but in severe cases of Rickets as many as fifty or sixty may be counted in a single column.

3. Beyond these, a layer of irregular calcareous trabeculæ enclosing here and there " islets of spongioid tissue " and tracts of hyaline cartilage.

It is the proliferation of the cells in the second layer which gives rise to " spongioid tissue." It was noted, in dealing with the morbid anatomy of this disease, that the ends of the long bones become very much enlarged ; the microscopic structure affords a satisfactory explanation. If a normal centre of ossification be carefully traced, it will be found to extend from a definite spot, known as the ossific centre. The border of advancing ossification is well marked, and the cartilage clearly and regularly disappearing. Such an epiphysis as this should be termed a " discrete epiphysis." In Rickets things go on in a very disorderly way ; instead of the earthy matter

being deposited in a definite spot, it is sprinkled irregularly throughout the terminal cartilage, so that it is no uncommon thing to find thirty or forty separate nuclei for such an epiphysis as that for the condyles of the femur. As these various nuclei become confluent, here and there little tracts of hyaline cartilage become enclosed by calcareous matter, constituting what I have termed "cartilage islets"; these are often of sufficient size as to need no artificial help in detecting them. For such a condition as this the term "diffuse epiphysis" seems applicable, as implying a condition of things in which lime salts are deposited in disorder in a softened cartilaginous matrix.

Thus far observation has been limited to the ends of bones and the epiphysial cartilages, but changes no less important may be detected in connection with the periosteum. In the normal condition, the deeper layers of this tissue are adding to the bulk of the shaft by the deposition of fibrous lamellæ, which subsequently undergo ossification.

In Rickets the periosteum is very thick, succulent, and trabeculæ of fibrillated tissue pass into the bone shaft but do not undergo ossification, so that in a transverse section of the shaft of a long bone, the familiar concentric lamellæ of the Haversian system is replaced by a narrow band of osseous tissue in the midst of a fibrillated matrix containing no calcareous matte whatever. This accounts for the extreme softness of the bones; later, if the disease be recovered from, all this softened tissue becomes impregnated with lime salts, and the bone becomes actually stronger than a non-rickety one. The result is common enough in children, but a very rare event among the less fortunate monkeys.

Whether we examine the bone at the epiphysis, or in the shaft, the truth of the trite definition expressed by Sir William Jenner in speaking of the disease in children strikes us with great force:—"In Rickets there is increased preparation for ossification, with an imperfect performance of that process."

The changes such as have been described here may be met with in all the epiphyses of the bones of the limbs, at the junction of ribs and costal cartilages, between the sternebræ, and at the junction of the epiphysial plates of the vertebræ with their centra.

"Spongioid" tissue is most abundant at the lower ends of the femur, tibia, fibula, radius, and ulna. It is always abundant at the junction of the rib shafts with the costal cartilages. It is least in quantity in the metacarpal and metatarsal bones, and is rarely met with in any quantity at the upper epiphysis of the fibula. These facts compel one to assert that "spongioid tissue" is most abundant in the epiphyses which are near joints enjoying free and frequent movements—to wit, the ribs in respiration, the legs and forearms in progression; but the head of the fibula moves scarcely at all, and there is scarcely ever any of Guérin's tissue to be found in that situation.

The effects of this early form of Rickets may be tabulated thus:—

1. Deformity of the chest and beading of the ribs.
2. General thickening of the periosteum and softening of the bones.
3. Thickening of the flat bones, and occasional thinning of the bones of the floor of the cranium.
4. Enlarged epiphyses and increased curvatures of long bones.
5. Collapse of lungs.
6. *Histologically.* The development of tracts of "spongioid tissue" at the epiphysial lines.
7. Compression of the spinal cord, due, in part, to yielding of the softened vertebræ, in part to osseous deposition in the posterior surface of the bodies of the vertebræ, chiefly in the lumbar region.

Rickets of Puberty.

This is comparable to the affection known as "Late Rickets" in the human subject.

Observations on this form of the disease have been conducted chiefly on baboons, bears, tigers, and lions. At first I was under the impression that Rickets underwent certain modifications corresponding to the species of the animal affected, but the notion was soon dispelled as my experience became wider.

Symptoms.—These are very few, but very definite. The animal shows signs of paralysis and defective dentition; gradually it becomes completely paraplegic and thoroughly helpless, and is killed on account of the paraplegia.

Visceral Lesions.—The only constant morbid condition in these cases is compression of the spinal cord, due to the bulging of the intervertebral substance, etc., into the neural canal. Fatty liver is frequent, and the only other constant abnormality is albumen, often in large quantity, in the urine. Phosphates are also present in great quantity, but there is considerable difficulty in obtaining the urine of monkeys in any quantity for the purposes of quantitative analysis.

Morbid Anatomy.—The pathological lesions in this form of the disease differ in their distribution, from those described in the "Infantile" form, in a very marked form.

1. The disease may be general.
2. It may limit itself to the axial skeleton.
3. The skull alone may be affected.

1. *The Generalised Variety.*—The thorax presents the usual "rickety rosary," and in some instances even a double row of beading, due to infractions; but the chest is not deformed, as is so common in the early form.

The Skull.—It is a peculiar feature of Rickets at this age, that enormous thickening of the vault of the cranium is almost constantly found, the hypertrophy limiting itself with anatomical precision to those bones of the vault of purely membranous origin; the base is rarely, in my specimens never, affected. The thickness of the parietal bone often exceeds the normal, some twelve or fourteen times. The facial bones may share in this hypertrophy, but by no means constantly.

The permanent teeth are late in erupting, due, I believe, to the thickening of the tooth-sac, shown by exposing the follicles.

The Vertebral Column.—The changes, which are of great interest, are best displayed by dividing the column vertically. This done, it will be seen that the body of each vertebra consists of three pieces, a centrum and two epiphysial plates. In health these complementary plates are separated from the centrum to which they belong by two narrow lines of hyaline cartilage throughout the period of growth. But when Rickets disturbs the usual course of things, proliferation takes place here, as in the epiphysis of a long bone, and the softened tissue, bulging towards the neural canal, encroaches upon the space set apart for the cord, and compresses it. In well-marked cases, the spinal cord will present alternate dilatations and constrictions, the former corresponding to the vertebral bodies, the latter to the epiphysial plates and the intervertebral discs. This singular state of affairs is, as might be expected, most obvious in the lumbar region. From the above explanation it is clear that paraplegia in "Rickets of Puberty" arises from a very different pathological condition to that which causes paralysis in the same disease at "Infancy."

(*To be continued.*)

ANIMAL DISEASES IN SOUTH AUSTRALIA.

THE report of the Inspector of Sheep for 1883 is more than usually interesting this year, and deserves notice for several reasons, and especially for the allusions to Swine Plague, Farcy and Glanders, Pleuro-pneumonia, and Rabies. The latter malady and Foot-and-mouth Disease are as yet unknown; but the existence of Glanders and Farcy is news, as we had been led to believe that the Australasian Continent was free from it.

With regard to sheep, the report (which is dated Adelaide, February 21st, 1884) says: "The flocks remain free from the 'scab' disease.

"Fluke has not shown itself more prevalent, the losses not being so heavy, but holders of country liable to Fluke may well be careful after the extraordinarily wet season with which we have been favoured. The use of salt and iron is increasing, but it is not so much used as it should be. In the south-eastern district, and in the south and part of the Wellington district, it might be used with great advantage. Wherever the disease known as 'coast disease' prevails the use of salt and iron will be found a decided benefit to the stock.

"Over 1,200 sheep are reported as having died from eating poison plant, between travelling stock and those on different runs. There seems to be no means of avoiding losses of this description, as even, with the knowledge that deaths have occurred on a travelling track a few months previous, the next flock may not suffer, the injurious plant having disappeared and vegetation being changed.

"The lambing in the settled districts has been good, and notwithstanding the heavy losses in the outside pastoral country, the general average may be considered over ten per cent. better than last year.

"From the reports received the clip has been a good one, although in some parts it has not been so heavy as usual. The reports from four districts are—wool sound, clean, good, and well grown. The returns show an estimated increase in the production of wool of over 2,000,000lbs. more in 1883 than in 1882."

With respect to cattle it is stated that in "the south-eastern district the reports on cattle have been very favourable, Pleuro-pneumonia not having shown at all. In the Wellington district there were some losses, but, except in one instance, the deaths were in the early part of the year, and of a non-contagious character. There was a large percentage of deaths in one lot from contagious disease. The losses from Pleuro-pneumonia have not been so great this year, but still quite enough to show the necessity there is for supervision. Eighty-seven cattle have been destroyed by the inspectors and drovers out of travelling droves. In one lot sixteen per cent. died; but the imported cattle have been much healthier this year than last. Several cases have occurred in which the owners have lost a heavy percentage on small lots, but of which the inspectors can obtain no reliable information, and will not be able to do so until it is compulsory to give notice to the staff of all stock showing disease.

"Twenty-nine only are noted as having been lost by farmers, all near the line of travelling stock, one having lost fourteen cattle. A number of deaths have occurred from inflammation and local causes; the inspectors have been called in in a good many cases, but in most instances the cattle have been suffering from non-contagious disease. Two cattle were abandoned, for which no owner could be found; they were destroyed. Laryngitis has been prevalent in several travelling droves, and also has been noted on the runs in the north-east; in one lot from Queensland thirteen died. Cancer occurs now and again, and occasionally cases of Ophthalmia, but not to any great extent. The general health of cattle of all descriptions may be considered good.

"In Melbourne a board of inquiry as to the prevalence of Tuberculosis is

sitting, and some important information will probably be elicited. Although cases of Tuberculosis have been rare in this province, there can be no doubt that an efficient system of examination of all cattle killed for consumption at slaughter-houses should be carried out here, as we cannot expect the stock to remain free from disease, and it may be expected that animals will be slaughtered which are unfit for consumption. The large consumption of animal food by all classes of people in the province renders it imperative that every care should be taken that the public are supplied with sound and good meat.

"The proposition which has been mooted in the other colonies to inoculate rabbits with Tuberculosis, should be well weighed and tested before being adopted, as it certainly appears to me that if the rabbits are so plentiful as to allow of the disease being spread amongst them that there must be serious danger of stock becoming affected by depasturing on the same country. This would mean introducing a far more serious evil than the benefit which will be derived from the introduction of such a disease with the idea that it would eradicate the rabbits.

"The imports during the year overland have been 434,808 sheep, 33,997 cattle, and 343 horses. The returns for the different colonies are—Queensland, 30,550 sheep ; 26,902 cattle ; New South Wales, 388,488 sheep, 6,432 cattle, and 288 horses ; Victoria, 15,770 sheep, 663 cattle, and 115 horses,—Queensland heading the cattle importation, and New South Wales a long way beyond the other two with sheep.

"The exports overland were—140,229 sheep, 2,246 cattle, and 550 horses, as follows : To Queensland, 4,224 sheep, 238 cattle (studs) ; New South Wales, 29,640 sheep ; Victoria, 106,365 sheep, 2,008 cattle, and 550 horses.

"The past season has," it appears, "been the best the country has been favoured with for years past, and stock of all kinds are thriving and healthy. The splendid season, however, has unfortunately not extended into outside pastoral districts ; and whilst stockholders and farmers within what may be termed the settled districts have been especially favoured, those on the outskirts, north, north-east, and north-west, have been suffering heavy losses from drought. In places where rain fell in the earlier part of the year the grasshoppers followed and swept off the green feed, whilst in our south-eastern district there are complaints of too much rain.

"Notwithstanding the drought in the outside districts, the splendid season within shows an increased percentage of lambs on the marking of last year.

"In response to a large number of circulars sent to sheepowners, I find there was an average increase in 1882 of slightly over 52 per cent. only from the breeding sheep, according to the returns forwarded by owners holding about one-half the number of breeding ewes in the province. Although the losses from drought, etc., have been heavy during both 1882 and 1883, the highly favourable season within the settled districts shows that an increase in the percentage of lambs marked in 1883 has been fully ten per cent. over that of 1882. The returns furnished by those sheepowners who kindly responded to the circular may fairly be taken as representing the average increase for the whole province. From 100 returns only, losses are reported amounting to 150,000 sheep in 1882, and in 1883 to 105,000. These losses are reported as being caused by drought, dogs, eaglehawks, poison plant, coast disease, and Fluke. The number lost from the last-mentioned cause has only amounted to a few thousand sheep. The numbers vary from ten sheep killed by dogs up to 20,000 and 42,000 died and killed by drought and dogs. I am sorry to report that these returns do not include the whole of the losses which have occurred in the outside districts.

"The inspecting staff have examined over 1,000,000 sheep, 53,000 cattle, 6,300 horses, and travelled over 28,700 miles on duty during the year.

"I wish to thank Mr. T. Chalwin, M.R.C.V.S., for the professional assistance which he, from time to time, renders the staff as honorary Government veterinary, giving me the advantage at any time of his professional knowledge in assisting to carry out the many duties of the department in connection with all descriptions of stock.

"The increasing number of cattle being introduced into the Northern Territory necessitates the appointment of an inspector to check the carelessness exhibited from time to time in leaving diseased animals on the travelling tracks. It is proposed to station an inspector near the Katherine or Elsie telegraph stations. The Queenslanders are already travelling cattle through the territory to Western Australia, and the route by the Elsie will probably be the one taken. The inspector will also be a check on the use of brands without persons first complying with the Brands Act. The returns of stock introduced into the Northern Territory part of the province are below the actual numbers, only 17,500 cattle and 300 horses being noted by land; at Palmerston 911 sheep were landed for killing, fourteen cattle, thirty-nine horses, and two swine.

"The reports from the other colonies of the health of stock have been favourable, with the exception of the information from time to time appearing before the board inquiring into Tuberculosis in Melbourne. In Western Australia the last information received has been satisfactory as to the eradication of Scab in sheep, the licensed sheep being confined to two districts.

"The unfortunate outbreak of Scab reported during this last week as occurring in New South Wales appears to show the necessity for dressing with known medicaments, and has certainly taken every one by surprise, as the regulations regarding the admission of sheep in that colony are particularly strict. It is expected that the precautions adopted will prevent any extension of the disease, and I do not consider it necessary to suggest any further precautions in regard to the admission of sheep into this colony from New South Wales than are at present in force. The Carcoar district is removed from any immediate communication with this province. Although prompt steps have been taken in destroying the diseased sheep (273 in number), the buildings and yards immediately connected with the flocks, there still must remain great uncertainty as to whether any disease has been left on the road from Sydney to the Carcoar district. The inspectors are now fully alive to the danger, and every precaution will doubtless be taken. It is satisfactory to have received an official communication which reports there is no reason to suppose that any other sheep are affected.

Swine Fever.

"This disease has diminished, there being on December the 22nd only seventy centres of disease, with 219 attacked during the week, and only twenty-two remaining diseased. During the three months ending December 22nd, 2,403 swine died or were killed.

Farcy and Glanders.

"During the three months ending December 22nd, the centres were reduced from twenty-three to fifteen; eleven fresh outbreaks occurred, five remained diseased, and twelve were killed.

Pleuro-pneumonia.

"This disease has decreased, although during the three months ending December 22nd, 362 centres were reported, 199 animals attacked, 146 killed, and twenty-nine remaining undestroyed.

Prohibition of Dogs.

"In consequence of representations from the New South Wales Government, suggesting that united action might be taken in prohibiting the importation of dogs into the Australian colonies, to prevent the introduction of Hydrophobia, inquiries were made, and it was considered advisable to join with the other colonies in prohibiting dogs, except under quarantine, from all places beyond the Australian colonies and New Zealand, and action was taken to frame regulations under the Public Health Act. The orders provide for notice on arrival of a vessel with dogs in South Australian ports being given to the inspectors, and all dogs require to be examined by a veterinary surgeon; if healthy, they may be removed into quarantine at Torrens Island for a term of six months; ships' dogs are allowed to remain on board the vessel, but must be carefully secured, and no dogs allowed on board any vessel from the land except under the liability of being destroyed; all dogs arriving diseased will be destroyed; the term and expense of quarantine being long and heavy, none but valuable dogs are likely to be imported.

"Thirty-seven dogs have been examined, and three were removed to the quarantine. One owner preferred destroying two dogs to paying the cost of examination and quarantine.

"The master of one vessel was fined ten pounds for not giving notice to the inspector as required, and a second information for transhipping without permit against the same master was withdrawn.

"The increasing means of communication with China and eastern ports, the growth of trade in that direction, and the quick means of transit with Great Britain by the mail and ocean steamers, make it more probable that disease may be imported. If by the course pursued the introduction of so great a scourge as Hydrophobia can be prevented, and there is every reason to believe it will, the prohibition and expense of quarantine are but a small consideration.

"Reports were obtained from London by the Government of New South Wales from Dr. Burdon Sanderson and Mr. Fleming, F.R.C.V.S., and the opinion given was that rigid prohibition, unless really effective quarantine could be guaranteed, was the proper course to pursue to prevent the introduction of Hydrophobia. Mr. Fleming mentions especially the case of the Mauritius, where Rabies is as prevalent as in England, and the Island of Réunion, where a strict prohibition has been maintained, and no case of Rabies has ever been known. He further says, 'that in order to maintain New South Wales and other uninfected colonies free from the dreadful scourge, two courses are open—either impose quarantine on imported dogs, or absolutely prohibit importation or landing of dogs from infected countries. But quarantine, to be effective, must be very strict; and as the period of incubation or latency of Rabies is extremely uncertain, ranging from a few weeks to more than a year, this quarantine should therefore be sufficiently long to cover the maximum term of latency.'

"Mr. Pottie, M.R.C.V.S., in Sydney, reported a case of Rabies in an imported dog, and Mr. R. Anderson, inspector of police, reported the killing of a dog by a constable who had no doubt as to the dog being mad, having killed other dogs suffering from similar symptoms in Liverpool. The New South Wales Government medical adviser, Mr. C. K. McKellar, reports 'that he can see no reason to doubt the cases related were true Rabies, and the only confirmatory test wanting was the inoculation and production of the disease in another animal.' It is unfortunate that steps were not taken to prove the genuineness of the disease.

Ostriches.

"Considering the rising importance of this industry, it may not be out of place to note some particulars of the advance that has been made. It is

only a short time since a few birds were imported into the province ; but for some time they did not thrive. Mr. Malcolm, after whom the ostrich farming company is named, however, entered into the enterprise with determination, and succeeded in raising some very fine birds on a small farm near Gawler. This, under liberal concessions from the Government, has now become enlarged into Malcolm's Ostrich Farming Company, and they have taken up two farms, one of 3,967 acres, near Port Augusta, and another on the river Murray, of 800 acres. The number of birds from the natural increase and from importation is now 335, besides which there are over 100 eggs at the Gawler farm.

"There was considerable mortality amongst the birds at first, but by good management the company have succeeded in overcoming the difficulties arising in acclimatising the birds. They are looking remarkably healthy, and are taking to their new quarters very well. Two shipments of feathers have already been made and realised a fair price ; and the future of ostrich farming bids fair to develop into a leading industry, and one which will prove of great benefit to small landholders who can supplement their grain crops by a valuable crop of feathers.

"The company have expended a large amount of money in buildings and fencing the runs, and the arrangements are very complete for the short time which has elapsed since the start.

"A second small establishment has been started by Messrs. W. R. Cave and Co., near Port Adelaide, in which there are twenty-three birds, all of which are said to be thriving, and the young birds already hatched are looking well.

"There can be little doubt but the industry will assume large proportions in the future."

THE FRENCH ARMY VETERINARY SERVICE.

It is very gratifying to be able to announce that the Government of the French Republic has at last taken the grievances of the army veterinary surgeons into consideration, and granted them a substantial concession in the form of an increase of relative rank, with the corresponding advantages and emoluments. Previous to this grant, the position of veterinary surgeons in the French army was nearly as inferior as it is in the German army. But thanks to the efforts of our esteemed colleagues, MM. Bouley and Decroix, the Minister for War, General Campenon, made an urgent representation of their case, showing that their situation in the army was, so far as the extent and *solidity* of their studies are concerned, the same as that of surgeons, that they had acquired a very high scientific character, exercised direct authority over the non-commissioned officers and soldiers in the veterinary infirmaries, had constant intercourse in the mounted corps with commanding officers, associating with the officers, and sharing generally in all the acts of combatants.

Principal veterinary surgeons of the first class have now the grade of lieutenant-colonel ; of the second class, major (*chef d'escadron*) ; first class veterinary surgeon, captain ; second class, lieutenant ; and assistant veterinary surgeon, that of sub-lieutenant.

THE BRITISH NATIONAL VETERINARY ASSOCIATION.

THE annual meeting of this Association, which took place at the end of July, was a decided success, the only mishap being the *contretemps* which occurred at the last sitting. With this exception, the discussions of the different questions were fairly and amply dealt with, and the proverbial hospitality of our Lancashire colleagues was amply displayed at the dinner, or rather banquet, they gave to those attending the meeting, as well as to a number of local celebrities. We have not yet received a full report of the meeting, but hope to give this in our next issue.

Proceedings of Veterinary Medical Societies, &c.

NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE usual half-yearly meeting of this Association was held on July 8th, at the Norfolk Hotel, Norwich, the President, G. A. Banham, Esq., F.R.C.V.S., Cambridge, in the chair.

The following visitors and members were present: Dr. George Fleming, Ex-P.R.C.V.S. and P.V.S. Army; A. C. Cope, Esq., Chief Inspector, Veterinary Department, Privy Council Office; W. Gladstone, Esq, A.V.D.; Captain Hayes; Messrs. A. E. Michell, J. D. Allman, W. Wright, A. H. Santy, W. Shipley, F. Low, W. J. T. Bower, S. E. Auger, R. Howard, E. Slipper, J. D. Overed (Hon. Sec.), etc., etc.

Letters were received from several gentlemen, regretting their inability to attend the meeting; and one from Mr. G. G. Whincop, stating that, his health being impaired, he had relinquished his practice in favour of Mr. J. Pollock, M.R.C.V.S., and as he was about leaving Norwich, he wished to tender his resignation, which was accepted.

On the motion of Mr. SANTY, seconded by Mr. SHIPLEY, Mr. Edward Slipper, M.R.C.V.S., Norwich, was unanimously elected a member of the Association.

The PRESIDENT then read an excellent inaugural address, for which he received the cordial thanks of those present, and kindly acceded to the request that it might be published, with the report of the meeting, in the next issue of the VETERINARY JOURNAL.

Gentlemen,—Allow me at once to thank you for the honour you have conferred upon me in electing me to occupy your chair for the ensuing year. To preside at the meetings of our societies is one of the objects which a veterinary surgeon should aspire to, and which, I think, most of us do, and appreciate the position very highly when we are elected. At least I can assure you that I do, and promise you that I will endeavour to carry out your wishes in every particular as far as I am able. To have a change of officers is good and necessary for societies, because it brings fresh energies to bear upon their welfare and advancement. Not only so, but it is imposing upon good nature to ask the same gentlemen, year after year, to undertake our hard work for us; and it is selfish on our part to abstain from sharing the labours required for carrying on the societies to which we belong. It was in this spirit, gentlemen, that I accepted the position you have so kindly honoured me with. However, I did so with some diffidence, because I was not forgetful of the qualities required to efficiently fulfil the duties the post entails, and I do not think I should have undertaken them just at present had I not been convinced—by my previous knowledge of our members—that they would do

all in their power to assist and support me in keeping up the prestige of the society.

It is usual, I believe, for the President to address the society at the first meeting after his election ; and although I did not like to make any exception to this rule, still I must be brief in my remarks, since our time is limited, and it will be much better occupied by hearing and discussing the subject so kindly brought before us to-day by Captain Hayes. There are, however, several subjects which are of great importance to us as veterinary surgeons. One is "Our Profession and its Government," and it is to this subject I would direct your attention. Most of us admit that the veterinary profession is one of the best in existence, from a humanitarian point of view, since no stronger proof of human kindness can be shown than that of relieving dumb animals of their pain and suffering, etc. ; and the profession should be second to none, scientifically, if we only made proper use of the advantages at our command, and prove ourselves worthy of that assistance so many of us consider our right.

Our claims are gradually becoming noticed by those in power ; for instance, army veterinary surgeons have undoubtedly been slighted for years, but they are now beginning to be recognised as men worthy of those distinctions so highly prized by army men, and which ought to be bestowed upon all who faithfully do the duty they are called upon to perform. I trust that before long our claim for assistance—to obtain a new building—from Government will be granted to us, as has been done many a time before to bodies not less deserving than our own. Before we claim assistance from our fellow-countrymen, however, we ought to look to ourselves, and see if we are doing all we can to bring the profession into favour ; for before we can expect the country to recognise us, we must show that we deserve it, by doing our very utmost to raise the profession, both socially and scientifically.

Much has of late years been done in this direction, and great credit is due to our governing body, the R.C.V.S., and I think the majority of the profession recognise this, although there are some who are continually checking progress and endeavouring to limit the powers of the R.C.V.S. We ought to remember that advance cannot be made by a few members of a profession only ; and our Council recognise this, for they usually endeavour to obtain the opinions of the profession generally before they take any decided steps in any movement which largely concerns the welfare of its members ; and on nearly all occasions our members have tried to assist and help them in their work. Now, let me urge the members of this society to assist them even more, if possible, than they have hitherto done ; for if we would advance we must work collectively, adhering to our motto in everything we do, setting aside all personal, pecuniary, or national feelings which may be prejudicial to the development of the profession.

Although our Council has been doing good work, and made headway, still it has not been done without a great deal of unnecessary trouble, nor have they given general satisfaction ; for we are constantly hearing complaints from one quarter or another. So much so has this been the case of late, that I began to question whether the constitution of our governing body was a fair and correct one or not.

When we look over our by-laws, however, and find that every member of the College has the power to propose whomsoever he chooses as a candidate for the Council, and that we all have as many votes as there are Councilmen to be elected, it appears to be as open and impartial as any system can be ; still we have murmurs, such as "the election of Councilmen should be based on a parliamentary basis" (Prof. M'Call's letter to his electors), and that there are "twenty-eight practitioners of England on the Council, and only two of Scotland" (VETERINARY JOURNAL, vol. xviii., p. 310). Such

complaints are not conducive to our unity or advancement, for they show discontent somewhere. Now, are such complaints justifiable or well founded? I must say I do not think they are. In the first place, we have the election of our Council in our own hands, and no one member is favoured more than another (unless it is the teachers in our schools, from their advantage of knowing so many members), nor do I know, as I have said before, on what better system our Council can be elected. Again, we must remember that although our Council is composed of a president, six vice-presidents, and twenty-four councilmen, the total number is only thirty, as the president is always elected from one of the Council; nor do the vice-presidents count, so far as we, as electors, are concerned, because we put this duty into the hands of the Council. Thus the twenty-four councilmen are the only persons we have to deal with, and these are divided into four groups of six, retiring in rotation, so that we have only to elect six annually, which actually reduces the work of election, very wisely, to a minimum, since it would not be judicious for us to have a fresh Council each year. Now, let us look at the election of the Council from—what some of our members would wish—a national point of view, *i.e.*, whether Scotland, Ireland, and England have their proper number of representatives on the Council, according to the number of practitioners in each country, or, in other words, is each country fairly and equally treated? The number of practitioners in England and Wales, according to the 1884 register, is 1,550; in Scotland, 330; and in Ireland, 160; that is to say, England has nearly $4\frac{2}{3}$ more practitioners than Scotland, and $9\frac{3}{4}$ more than Ireland. Thus, for our Council to be equally representative of the three countries, England should have at least $4\frac{2}{3}$ more on the Council than Scotland, and $9\frac{3}{4}$ more than Ireland; or, in round numbers, for every one Irishman there should be two Scotchmen and ten Englishmen representatives. I must leave you to judge for yourselves whether our present Council is fairly representative of the profession from this point of view or not, but I should like to draw your attention to some of the inconveniences which such an arrangement would entail, even if it could be strictly carried out. We should have to alter the number of our Council, and also of those annually elected, and this would necessarily be continually changing according to the increase or decrease of practitioners in one country or the other. Again, even if our charter allowed us to follow such a method, I am afraid we should soon have disagreements between counties, etc.; for instance, Lancashire might begin to find fault with Middlesex (or *vice versâ*), because they were unequally represented, and some of the counties would not be represented at all any more than they are now. Moreover, we might find a difficulty in finding the requisite number of representatives, in one country or the other, at the proper time, and this difficulty would be increased in a year or two, for, as our charter now stands, the election of councilmen will be limited to Fellows of the R.C.V.S. Whether this latter restriction is wise or not, seems to be, at present, questionable, and will, doubtless, before long be discussed at the Council chamber. If I may be allowed to express an opinion on this subject, I should say it is a step in the right direction, for if our members value the post of councilman as one of honour—as it undoubtedly is—it will be an inducement for our members to become FELLOWS, and a seat in the Council will be something to be aimed at, and if obtained partly—if not wholly—repay them for their trouble. It is such inducements as these that make men work and produce progress; and it is only the enthusiastic, aspiring, ambitious, working men that are usually of much service in improving anything. Therefore, I should be sorry to see any attempt made to postpone or alter what the Council of 1876 thought fit to advise.

It has been hinted that the number of Fellows at present is too small to furnish sufficient to form a Council, but if we look at the actual number of

men from which our governing board has been formed for the last ten years, we shall find that only sixty-two individuals have been required to furnish a President, six Vice-presidents, and six members of Council annually; and of these only twenty-two were not Fellows. The number of Fellows of the Royal College at present available for Council purposes exceeds 100, and they alone would carry on our business for some time to come, even if no new members aspired to that degree. Therefore I think we need have no apprehension if our charter of 1876 is religiously adhered to.

To equally distribute the number of representatives on our Council to countries is decidedly difficult, and would be unsatisfactory, because, if both Scotland and Ireland were fairly and equally represented on the Council, they (both together) would still be in the minority as they are now, and England would be ruling as heretofore, and little would be effected by the change. Not only so, but there is another large section of our profession which has an equal claim to be represented on our Council, which, from their number (about 150) nearly equals all Ireland put together; I mean the Army Veterinary Department, which, from the good service many of its members have afforded our professional progress, ought not to be overlooked or ignored by us when considering this matter.

To what extent ought the powers of our governing body to be limited? is another question we may well ask ourselves, after the glaring disappointments our Council has met with. It seems they have not only to please those who send them to govern (the members of our profession), but other extraneous corporations and societies who have nothing whatever to do with our profession; and I think it is time pressure was brought to bear on such bodies, in order to check their interference with our affairs. The point I allude to is probably *the one* we, as country practitioners, are most familiar with, viz., the pupilage question, which was expunged from the last supplemental charter by the Privy Council, owing to pressure brought to bear on it by the corporations of Edinburgh and Glasgow and the Highland and Agricultural Society of Scotland. What claims the corporations of Edinburgh and Glasgow have for interfering with our government I do not know, and I think the Highland and Agricultural Society should have no claim after the generous way the Royal College of Veterinary Surgeons admitted their graduates. In fact, I understood that they gave up all claims on the veterinary profession after the agreement between that Society and our profession was signed. Whether this be so or no, I maintain that the whole of the educational standard of the veterinary profession should be regulated by the profession itself through its governing body, "the Council." Not only should the matriculation examination be controlled by them, but all other tests to which a student is to be subjected before receiving the diploma of the Royal College of Veterinary Surgeons. They should, moreover, have the power to stipulate, in a general way, the course a student should pursue in order to obtain his education. For instance, no student should be allowed to present himself for his professional examination without having certificates to show, 1st, that his education was of the standard required; 2nd, that he had regularly attended the requisite number of terms at a recognised school; and 3rd, if the Council is satisfied that any extra training in any branch is requisite—such as a period of "pupilage with a practitioner" is likely to give—they ought to have the power to enforce it, just as they have the power to enforce the attendance at a professional or educational school. However, the schools thought fit to prevent this power being obtained for reasons of their own. The schools quite agree with the students being forced to attend their institutions—in fact, to be protected—but they do not think the Royal College ought to have any protection for itself. If the Royal College of Veterinary Surgeons have not the power to enforce a period of pupilage with a practi-

tioner, why should they force a period of pupilage at a school? Why not open their examinations to all comers, disregarding the source from whence their knowledge was obtained, so long as the candidates paid the examination fees? If such a system as this were agreed to what would the schools say? They would, undoubtedly, expostulate with us at once, and I think we, as members of the veterinary profession, have good cause to remonstrate with them at having to submit to our Council being overruled by the minority calling in extraneous assistance to carry their point. If we are to be governed in this manner, our Council is a myth, and worse than useless. For upon this particular question our Council did not act hurriedly nor independently, as they obtained the general opinion of the profession through the medium of nearly all such gatherings as ours to-day, and I contend that, however little general practitioners may know—as a rule—about the requirements of a student's education, they are competent to judge upon this question, and ought not to be ignored and their Council defeated by pressure from bodies who know nothing of us or of our requirements, save through a minority of our members; and the sooner we endeavour to remove such restraints as these the better will it be for our governing body and the profession generally.

There is another of these grievances which has lately become rather public —I mean the examinations to which our Council think fit to subject their students before granting them their diploma. Last year, when the "pupilage question" was being discussed, the opponents of the clause made the "tests" their strong point, and told us that we should raise our standard of the "practical examination" to whatever point we wished, and the schools would then have to work up to it. Now, what do we find the result of such remarks is, before a year has elapsed since they were made? Why, simply that some have taken upon themselves to imagine and publicly announce that injustice is being practised by the examiners. As I am a member of that Board, I am somewhat in a position to explain the truth of the statements that have been made. I do not think I should be doing my duty to the Council, their Examining Board, or myself, were I to pass over this subject, on such an occasion as this, without alluding to it, although it is anything but pleasant for me to do so. Let me point out some of the erroneous parts of the assertions I allude to. (Letters by "Justitia" in the April, and "Vindex" in the March numbers of the *Veterinarian* of 1884.) You are led to understand that *one* examiner has the power to reject a candidate, even in opposition to the desire of his colleagues. Now, this is utterly *false*, for our bye-laws wisely provide against any contingency of this nature, as No. 41 says: "Should the result of the examination of any candidate for the diploma appear doubtful, such candidate shall be recalled and examined before the whole Court." Therefore, if the Board of Examiners had any doubt that a student had not been fairly examined, they have the remedy in their own hands, and I can assure you that ever since I have had the honour of sitting on your Board of Examiners, I have never yet known a case when good reason has not been given by any examiner for rejecting a student when it was necessary to ask for it; and what is more, most of the candidates that have failed have done so at more than one table; and those that only failed at one table were not at all brilliant on some of the other subjects. Now, let me direct your attention to how far one examiner has the power of rejecting a student. As you probably all know, the Board consists of two examiners at each table for the 3rd (C) or final examination. Of course the candidate only receives questions from one of the examiners at the same time, still the other examiner is there, listening and judging of the questions his colleague puts, and the answers he receives, so that virtually two persons are examining the student at all times. But this is not all, for our wise Council ordains by

its Byelaw No. 40 that "every student shall be examined by each division of the Court, and at the conclusion of the examination the examiners shall reunite, and each division report the result of the examination to the Chairman, when the *sense of the whole Court* shall be taken as to the qualification of the student." Now, gentlemen, if these laws have been strictly carried out by your Board of Examiners (and I can honestly and truly inform you that they have ever since I have known it), how can the statements that have been made be accurate? Again, it was stated that one of the students had to examine a horse in the dark. Now, this is simply ridiculous, since the *practical* examination is always carried out between the hours of 10 a.m. and 3 p.m., and I am sure no restriction is ever given to the students as to what they shall do with the animal given them to examine. They can take it under a covering, in the open air, or between the two—in fact, anywhere they choose under the eye of their examiner, and no examiners can be more considerate and kind in their work than the four gentlemen your Council have selected to perform that duty at the present time.

There are several other assertions in the letters I refer to equally false, nonsensical, and anything but complimentary, but I will not occupy your time with them. There is, however (as is usually the case in such misleading letters), one redeeming feature in your Examining Board's favour, and that is, in one case the student was rejected on the same subject, viz., "*Practice*," at both his examinations, clearly showing that—in that case, at any rate—your examiners were correct in their decision, for a person to be rejected *twice on the same subject* evidently shows it is his "weak point"; although I would remind you that, even if this were not the case, it would not be surprising, for there is a large field in all the subjects, and a candidate may, in one examination, be fortunate enough to be asked questions on that part of the subject he knows well; whereas, in his next examination, he may be taken over a part he knows but little; and unless a student studies *every* portion of his subject, and knows at least something of all, he is not safe. An examiner can only judge of his candidate by the answers he receives from him *at the time*, and cannot take into consideration the answers he received from the same student at his last test.

If each examiner had to test the candidate on *all* subjects, as it appears to me some would wish were the case, I am afraid that, instead of its being the exception that the principals of the schools are surprised, fathers disappointed, and students unsuccessful, as it now is, it would then be the rule; and inflict more trouble, expense, and study than our present system does, even if we could find fit and proper persons to fill such an Examining Board.

I fear, gentlemen, I have taken up too much of your time with these grievances in our camp, but they are of such importance to our professional advancement, that I felt bound to bring them before you, and I had confidence you would willingly hear them. You will, doubtless, gather from the foregoing, that some of our members require alterations opposed to those wished by the profession at large. Now, I would ask you whether it is your wish that the "majority" should be governed by the "minority"? I should decidedly say, "No," but the minority should learn to willingly give in to the majority on all occasions, and abide by the consequences; and until this is agreed to, and acted upon, we shall continually have such drawbacks as I have brought before you to-day. If we look at our profession and ask ourselves whether we can afford to foster any jealousies, I think most of us will answer in the negative; for we are but a small profession at the most, and we should all strive for its prosperity and happiness by putting aside all national, scholastic, cliquish, or individual interests which may stand in the way. The veterinary profession should not be viewed from any such narrow-

minded aspects; it is the same, whether in Scotland, Ireland, Wales, or England, and if a few more Englishmen are on its Council and Examining Boards, what does it matter, so long as they are honest, earnest men, striving for the common good of our cause? If all our Councilmen were of such a nature we ought not to object, even if they were all Scotchmen or all Irishmen. These "party spirits," which appear to be so rife, certainly show that it is not the "profession" but something else which is uppermost in their minds and actions.

No! gentlemen, our Council should be elected by the majority of our members, and the candidates from the *profession*, and not from *sections* of it; and when they have been so elected, we ought to give them all the power we can, and not permit, in any case, the minority to bring any extraneous pressure to hamper and obstruct the wishes of the majority from being carried out. If we do, our Council is no longer representative, or of any value to us.

The same spirit should be adopted in the Council when they are choosing their Examining Boards. They should be composed of those best fitted to fill the post, disregarding all national, scholastic, or even individual peculiarities; and no obstruction should be allowed to come in the way of their freely carrying out the duties imposed upon them.

Of all the influences at present at work, which are calculated to clear the minds of our members of prejudice, and to liberalise their thoughts upon professional matters, such meetings as these are, in my opinion, foremost, and should be encouraged by all of us. I am pleased to see that three new societies have been formed this year, and should like to see twice that number formed next, if necessary—for nothing tends so much to enlarge the minds of practitioners, and produce that social and friendly feeling which is so essential for the common good of our craft more than coming into contact with each other and the public. I only hope that all the new societies that are formed will give their support to the National Veterinary Association, whose object is to link the members of all the local societies and the profession generally together, so as to bring the various kinds of local influences on to a common platform, where they can operate for the good of the profession at large. Although the Scotch societies have started an annual meeting amongst themselves, still I trust that will not debar them from assisting us also, by inviting our National Association to hold one of its meetings in their country, and prove to us that the national bias which seems to be lurking about is but ephemeral, and not meant to split up the little camp that has 'struggled on so long. If they and our Irish confrères will oblige us in this, I am sure our members would willingly take advantage of it, even if it were for no other purpose than that of visiting their countries at a genial part of the year.

Gentlemen, there were one or two other subjects which I should have liked to have mentioned to you, such as professional etiquette in its bearing on the solidarity of the profession; the apathy of our students in taking advantage of the prizes so kindly offered to them by the donors; the new work that has been done during the past year, and a few hints upon the field for work that might be carried out, and some other such general subjects which are of more or less importance to us; but I am afraid I have occupied your time too long already. Permit me to thank you for the patient way in which you have listened to me; and, in conclusion, allow me to ask you all once more to give me your support and assistance by freely ventilating your thoughts and experience upon all the subjects that are brought before us, by word of mouth, for our mutual benefit.

Captain Hayes, M.R.C.V.S., Newmarket, was next requested to read his paper on the "Conformation of the Horse," which proved to be both highly

interesting and instructive; at its close an animated discussion ensued, in which Dr. Fleming, Messrs. Banham, Bower, Santy, Shipley, Overed, and others took part.

On the Conformation of the Horse.

Gentlemen, it has doubtless often struck you as being strangely anomalous that men who know nothing about the anatomy of the horse should, as a rule, be chosen as judges of the make and shape of the animal at the various public shows. The absurdity of the thing appears, at first glance, to be so glaring that we might be tempted to compare the so-called practical horseman, who lays down the law as to conformation, merely from his knowledge of the exterior of the animal, to a person who thought himself fully qualified to decide on the value of a watch, although he knew nothing of its internal mechanism. There is, however, a great deal to be said on both sides; for acquaintance with equine anatomy alone is not sufficient to instruct the student in the subject in question, while we must go somewhat beyond its domain and that of practical experience in order to formulate the laws of conformation. I think you will all agree with me in saying that the more a veterinary surgeon knows about horses, the more he will respect himself, and the more will he gain the confidence of his clients, provided always that he is able to give a sound, good reason for any views which he may advance. During the limited time at my disposal this afternoon, I cannot do more than briefly sketch the salient points of my subject, although I trust later on to fill in the details and work up the material into book form. I have not the presumption to think that anything I may say will be entirely new to the members of this scientific assembly which I have the honour to address; but I do hope that in the subsequent discussion I may acquire much useful information, which I will be proud to utilise in my attempt at supplying a want in equine literature.

The points of the horse may be broadly divided into those coming under the following headings, viz.:—

1. Beauty.
2. Strength.
3. Speed.
4. Wind.

The subject of good looks may soon be dismissed, for its canons are well understood. I must say that however undesirable a Roman nose and coffin-shaped frontispiece may be, still an unusually small and pretty head is not unfrequently united with a jady disposition, as is the case with that unreliable racehorse, the "Prince." The neck, as we know, should run into the head by means of a curve, which gives the part the beautiful setting-on that we admire so much in the game-cock. The fact of "St. Gatien's" head being set on at an angle to his neck undoubtedly prejudiced persons against him before he ran for the Derby, although, had they analysed the matter, they would have seen that this slight appearance of meanness in looks was no detraction to his racing pretensions, as I expressed myself to his owner, Mr. Hammond, when that gentleman had the kindness to show me the colt in his stall shortly before he ran at Epsom. I am not satisfied as to the causes which produce this difference in the setting-on of the head and the neck. Perhaps the unsightly conformation is due to the fact of the animal being more or less ewe-necked, while undue prominence to the occipital crest or want of development of the muscles that are attached to the occiput, and serve to extend the head, would aid in rendering the defect still more pronounced.

As regards colour, I need only remark on the not unreasonable prejudice against mealy chestnuts and washy-browns, especially when the colour becomes

lighter under the abdomen and on the insides of the limbs ; and to state the fact that the darker the coat, the better will the animal stand exposure to the influence of a tropical sun, other things being equal. I mention this merely as an interesting point in equine physiology, and one that is borne out by the fact that in torrid zones animal colours are more pronounced than in frigid ones ; as witness, the dark skin of the negro, and white colour assumed by the fur of the hare in northern climates on the approach of winter. The reason for this is, that although the dark surface will absorb heat more rapidly than a light-coloured one, it will radiate heat in a still faster degree.

We now come to the important subjects of strength and speed, which are dependent on the shape and size of the muscles, and on the form and arrangement of the bones. The action of a muscle is affected by its length and by its transverse section ; for the longer it is, the greater space will it be able to move the object to which it is inserted, while the thicker it is the stronger will it be. We know, from experiment, that a muscle can contract to about two-thirds of its passive length ; hence, if one horse had a *gluteus maximus* one inch longer than that of another horse, he would, other things being equal, be able to move the end of his femur nearly three inches further to the rear than the other horse could do ; and, consequently, his stride would be greatly increased by this slight increment of length to the *gluteus maximus*. In making this calculation, I have assumed that the trochanter major extends above the head of the femur for about the ninth part of the entire length of this bone.

We know that, as a rule, a high degree of speed, whether in horse or man, is unattainable without length of stride ; in other words, the successful sprinter or speedy racehorse must have long muscles. We see this law well exemplified in the champion, "Harry Hutchens," who ran 300 yards in thirty seconds, and in Lord Alington's peerless miler, "Geheimniss." Exceptional strength, on the other hand, is obtained by thick muscles, which are usually short. Comparative anatomy affords us a striking proof of the fact that quickness of movement must be obtained by length of muscle ; for, as remarked by Professor Marey, of the College of France, birds that move their wings very rapidly have long sternums and, consequently, long pectoral muscles ; while birds, like the albatross or eagle, that have an enormous expanse of wing, and are, on that account, obliged to move their pinions slowly, though with great force, have very short sternums, the keels of which are very deep, for the attachment of the short, thick pectoral muscles. We may therefore assume that for speed, the muscles of locomotion in the horse should be as long as possible, while, if their length be granted, they cannot well be too thick ; for even in the racehorse strength is an essential condition for staying and carrying weight.

Let us now glance at the various parts where we specially require length of muscle for obtaining speed.

We know that the possession of a fairly long neck is an imperative condition for the attainment of speed and staying power ; the reason for this apparently being that the cervical vertebræ and *ligamentum nuchæ* afford attachment to important muscles used in progression, such as the *levator humeri trapezius cervicalis*, and *rhomboideus longus*, and to inspiratory muscles, such as the *scalenus* and the *serratus magnus*. (*Levator humeri ;* one tendon to crest of occiput and mastoid process of temporal bone, other tendon to wing of atlas. It advances entire limb.) Length of scapula confers length to the spinati and caput muscles ; while that of the flexor trachii depends on the extent of the humerus. The extensors and flexors of the carpus and joints below it gain their length from that of the radius. One of the most important points to be looked for in the racehorse is length of pelvis, so that the gluteus maximus may have full scope to act. This point is generally

overlooked by unqualified judges, as they are specially ignorant about the anatomy of this portion of the horse's system. As that all-important muscle of inspiration, the diaphragm, is attached to the distal ends of the last twelve ribs, or to their cartilages, we naturally look for the "back" ribs to be long, strong, and well arched, so that this muscle may be of large extent and firmly supported by its attachments.

The desirability of the metacarpal and metatarsal bones being short, in all classes of horses, is admitted by every one, although the reason why this point should be considered valuable is not, generally, well understood. Let us first take the hind extremity. In it we find that one of the chief levers which move the body forward is formed by the bones of the limb from the point of the hock downwards. When the hind toe is applied to the ground as a fulcrum, the power is furnished by the contraction of the muscles whose tendons go to the point of the hock; while the tibia is the weight moved onward. Here we have a lever of the second order, and, consequently, the shorter the distance between the weight and the fulcrum, or, in other words, the shorter the hind cannon bone, the greater will be the mechanical advantage at which the gastrocnemii muscles will work. In the fore limb, the bones below the knee serve as a lever for the flexors of that joint. These muscles are the power, the radius is the fulcrum, and the pressure of the foot on the ground is the weight to be moved. Here we have a lever of the third order, and, consequently, the shorter the cannon bone the greater will be the advantage at which the muscles will act.

I may remark that that good horse, "Ossian," who won the St. Leger last year, was one of the rare exceptions to the rule, that to be successful on the turf an animal should have short cannon bones, as his knees and hocks were high above the ground. He, however, made up for this defect by the possession of several good racing points. One of the best examples of speed and power being conferred by the advantageous arrangement of bony levers, is afforded by a horse that has a long os calcis, especially when the large metacarpal bone is short. Length of the os calcis gives that breadth to the gaskin which is so much to be admired in every horse, and which is so specially noticeable in the perfect thorough-bred. When we meet with a racehorse that has the faculty of galloping and staying, although it may be deficient in size and volume of muscle, we may be almost certain that it has enormous gaskins. "Lucy Ashton," who won many races as a two-year-old this season, was a remarkable instance of this, as she was a mean, weedy little thing in every respect, except in the possession of long ossa calces, which made her gastrocnemii tendons stand out in broad relief from her tibiæ. I may observe that this breadth of limb just above the hock is hardly influenced at all by muscular development.

Bent or "sickle" hocks are very faulty in conformation; for the horse who is cursed with this defect is unable to extend these joints as much as he ought to do. Amateur horsemen being probably misled by the term "bent" being applied to such hocks, not unfrequently consider that a horse with sickle hocks can bend them better than an animal which has straight ones, and consequently that the former is superior to the latter for cross-country work. Nothing could be more absurd; for both forms of hocks can be equally flexed, although they cannot be equally extended. As well might we say that it would be an advantage for a runner or jumper not to be able to "get on to his toes," by reason of inability to extend his ankle joints, which are the homologues of the hocks.

From the knee to the hock, the flexor tendons should run as nearly as possible parallel to the cannon bone. If the lateral width of the fetlock is so great as to make them converge in a marked manner towards the head of the cannon bone, the leg will be ill-fitted to stand hard work, no matter how much

it may measure below the knee. The reason for this appears to be that, with such a conformation, these tendons, not being able to work in a straight line between the fetlock and their insertion into their respective muscles, will be unduly liable to sprain. Here we must draw the nice distinction between tied in at the knee and light below the knee. Many racehorses, like the well-known four-year-old, "Dalmeny," for instance, have legs resembling the proverbial tobacco-pipe stem, but they successfully stand all the hammering incidental to training and racing, as their flexor tendons being almost parallel to their cannon bones escape being jarred against the posterior annular ligaments of the knee. I need hardly say that the perfect leg is one which is properly formed, and also, is of large measurement.

Horses required for fast work should have the pasterns of the fore legs moderately long and fairly sloped, in order to obviate the risk of sprain to the suspensory ligament, and of concussion to the bones and fetlock joints. In fact, the harder the ground, and the faster the pace, the more imperative is the necessity for sloping pasterns, which, however, are a disadvantage when strength is the desideratum. As the chief office of the fore-limb is to act as weight bearers, while that of the hind extremities is to serve as propellers, we find that in the true-shaped horse, the hind pasterns are more upright than the fore. Among horses that work unshod, it will be found that the slope of the hind hoof at the toe will be about 60°, while that of the fore-foot will be about 50°. These facts should be borne in mind by shoeing smiths, so that, by an improper method of shoeing, they may not force the hind limbs to work at a mechanical disadvantage.

Long sloping shoulders are to be desired in all classes, except the heavy cart-horse, who requires a more upright and massive conformation to work well against the collar. The cross-country horse, above all others, requires oblique shoulders; for the more sloping they are, the less weight will be in front of the fore-legs when the animal lands over a fence, and, consequently, the less tendency will he have to come down. For steeple-chasing, a long flexor trachii and a long caput magnus for rapid extension and flexion of the shoulder are imperative. The hack, also, requires that part to be oblique; for the more sloping it is the less weight will be in front of the foot on its coming to the ground, and the greater tendency will the animal have to bring his heel first down and not his toe. I may remark in passing, that if the heel touches the ground first the horse is almost certain not to stumble. Although the shoulder is not regarded as a very important point in the racehorse by many owners and trainers, still, nearly all the best racers, as, for instance, "St. Simon," have good shoulders.

The saddle-horse, as the old saying expresses it, should be short above and long below. In other words, his back should be comparatively short; while his sloping shoulders and long pelvis should enable him to cover a considerable distance of ground. The light harness-horse and lady's horse may have more length of back.

For horses that are used at fast paces, the transverse section of the chest should be a decided oval, so that the increase of capacity during inspiration may be as great as possible.

The points of conformation in which the heavy cart-horse differs from the light-saddle animal are that his shoulders should be more upright and massive, chest broader, pasterns shorter and straighter; while his muscles of locomotion should be distinguished by their thickness rather than by their length; and, consequently, the bones of his limbs will be thicker and shorter.

On the motion of the President a hearty vote of thanks was accorded to the essayist for his interesting paper, with the request that it might appear in the VETERINARY JOURNAL, to which that gentleman consented,

and in acknowledging the vote of thanks expressed the great pleasure it had afforded him to be present at this meeting of Norfolk veterinary surgeons, and to visit a county which had obtained such a wide-spread reputation for its celebrated breed of horses, especially roadsters.

The visitors and members afterwards dined together, under the genial presidency of Mr. Banham, Mr. Santy kindly occupying the vice-chair, when the loyal, patriotic, and professional toasts were proposed and heartily responded to, a most agreeable evening being spent.

JOHN D. OVERED, *Hon. Sec.*

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

(*Continued from page* 144.)

The PRESIDENT: The paper is now on for discussion. I shall be glad to hear from any one on this very interesting paper.

Mr. GREAVES said, maintaining that Glanders was on the increase, that he had been told of many cases in London and Manchester. He had known fifteen horses in one establishment attacked at one time. It was confined nearly always to old stables; new stables were generally free from Glanders, but from old ones it was difficult to quite get rid of it.

Mr. FRANK HOLMES cited a case which he believed followed on Influenza or Strangles. His father attended these horses, and pronounced them to be suffering from Glanders, but the owner of the horses was not satisfied with this judgment, and Captain Russell came and examined the horses, and declared the disease to be Nasal Gleet. He trephined one of the animals in the superior maxillary sinus, but found no matter there. He then opened the frontal sinus, but found none there. He (the speaker) passed in the meanwhile and was appointed Inspector. The police gave notice to him of this case, but he could find no discharge from the nasal chamber, though he fancied in two or three cases he could see small spots. He informed the owner of the horses that he thought it was Glanders, but he still stuck to his own opinion. A donkey was purchased, and he vaccinated it with the discharge from the horse's nostril, and in thirteen days it died. He (the owner) was still not satisfied, and a second donkey was purchased and inoculated, and it died in thirteen days. He would like to know if any one here believed in the spontaneous origin of Glanders or not.

Mr. HOOL did not think it would arise spontaneously.

Mr. HOLMES said these cases afterwards turned out to be Glanders, because he heard from the people who afterwards bought them, and they died in their possession.

Mr. HOOL asked if any one had noticed any rise in the temperature during Glanders.

Mr. THEAKSTON: I don't think there is.

Mr. GREAVES: I can't answer that.

Mr. HOOL: Can you detect it in the early stages?

Mr. THEAKSTON: I have seen it in the College, and I don't think you can detect it in the early stages.

Mr. HOOL asked if it were possible to have ulceration of the Schneiderian membrane without Glanders. Mr. GREAVES: If you have ulceration of the membrane, you decidedly have Glanders. You may have tumefaction of the superior maxillary gland, but if it continues hard for weeks and there is a discharge from the nostril, even if there is no ulceration, it is a case of Glanders, and ought to be destroyed. If there is ulceration and discharge, you can call it by no other name.

Mr. HARDY said he saw a case once in which the ulcer had gone right

through the septum. He was called upon one day by a man who said he had got a horse that had a running at the nose, and he wanted a few balls. He came again and said it was still discharging. He took some more balls, and a week after he called him in to see it, saying it had been discharging six weeks or two months, but from one nostril alone, and it was not at all fetid. The horse was gradually wasting in condition, and he found the *septum nasi* extensively ulcerated, through one of which he could get his finger. He had it killed. He found extensive ulceration down the nostrils to the lungs. This horse stood between two others in the same place—a badly-ventilated stable, scarcely six feet high, and they never had the slightest symptoms.

Mr. GREAVES: They must have been very unsusceptible subjects. There is not one horse in fifty but would have been glandered under those circumstances.

Mr. FIELD said he saw the horses referred to by Mr. Holmes, and he suggested inoculation.

Mr. GREAVES said he thought he might say truthfully that he had never seen a case of cold or Nasal Gleet develop into Glanders.

After further discussion,

Mr. MACKINDER said he remembered a case in which it was necessary to pull down a stable and burn it before Glanders could be eradicated. Ulceration, he went on to say, was a supposed symptom of the disease, but he had seen cases of Glanders where there was no ulceration at all. In the first stage there was a discharge and hardening of the membrane, but no ulceration. They were destroyed on suspicion of having Glanders.

Mr. HARDY: You can't destroy them on suspicion.

The PRESIDENT: You can by giving fourteen days' notice.

Mr. SMITH: If the Local Authorities are satisfied the cases are Glanders, they can give the order to destroy.

Mr. HARDY said it was different if they isolated the cases. He did not think they should destroy on suspicion.

The PRESIDENT remarked that the Local Authorities did not allow compensation for diseased animals.

Mr. HARDY: They can't allow compensation in the cases of Glanders, but they will if destroyed on suspicion.

The PRESIDENT said he seized one in Peterborough with Glanders, and had it destroyed. One of the owner's own mates whispered to him, and said he had another one at home. He wrote to the veterinary inspector, and he found a glandered animal, and the man, for not giving notice of it, was heavily fined by the magistrates.

Mr. GREAVES: But if he keeps it in his own stable, and never takes it out, what power have you then?

Mr. SMITH: In a case of suspected Glanders notice should be given to the nearest police-constable.

Mr. MACKINDER: There is a £20 penalty for neglecting to give notice.

As to the spread of the disease through a stable, Mr. GREAVES said he remembered a case in the middle of a stable of eighty horses. It was removed, and fires were lighted in the stalls, and no other horses became infected. He asked if a cow was capable of taking the disease of Glanders, and Mr. HOOL said he had never seen it in a cow.

Mr. GREAVES asked Mr. Taylor, of Manchester, his opinion upon the subject before the meeting.

Mr. TAYLOR, having first thanked the members of the Society for their kindness in extending an invitation to him, said that he did not know he could add anything to the discussion. There were one or two points which caused him to remember certain cases of so-called Farcy without any glander symptoms being present; and, after treatment by his father and himself, they

perfectly recovered. In one case he knew the animal remained with five or six other horses in the stable, and no further symptoms in the animal or those with it were developed. In another case Glanders went through the whole of the stable. He certainly shared the feelings of Mr. Hardy with regard to the cautious manner in which we should proceed in cases of suspicion. Some time ago he was called in to see a horse that was supposed to have sore throat and cold. There was a tumefaction of the sub-maxillary gland, and also a discharge. The superficial lymphatics of the hind extremities were tense, and glands enlarged and tumefied. It was only a young horse in the pink of condition and the only one the man had. It was five years old, and he did his best to obtain a history of the case, as to whether it had been associated with other horses, etc. He pointed out to the owner the application of the law, and he left it with him (the owner) to destroy it if he chose. He must disagree with the belief that horses that were suffering from Glanders ought to be and could be on the authority of the Act destroyed. In doubtful cases the resort to inoculation was the best proof of the presence or not of Glanders or Farcy. He had seen cases of Glanders where there had been no ulcers on the mucous membrane. Whenever there was any doubt it was always most prudent to resort to isolation.

Mr. GREAVES : Supposing there were ulcers, and tumefying glands, and a discharge from the nostril for several weeks, would you have any hesitation in declaring it to be Glanders?

Mr. TAYLOR : None whatever, though it depends upon the nature of the discharge. It is sticky, gummy, and adheres to the edge of the nostril. If there were tubercles on the lungs, it was Glanders.

Mr. FIELD asked if it were not a fact that Prof. Sewell drove two glandered horses for years.

Mr. TAYLOR further expressed his opinion that Glanders would never be eradicated until the Contagious Diseases Acts were carried out to the letter.

In reply to a question, Mr. HOLMES said there was a rise in the temperature of the donkey he inoculated three days after the operation.

The discussion then terminated, and

Mr. HOLMES said he wished to ask if any one here had ever known a straw or bent in the teat of a cow without being placed there.

Mr. HOOL said he had known boys do it.

Mr. HOLMES said he had three times found a straw in the teat of a cow, and the opinion was generally expressed that it had been placed there by some one.

Mr. THEAKSTON : What is your idea of docking horses?

The PRESIDENT : I shall dock them until I am stopped.

Mr. GREAVES : Professor Robertson and Professor Brown speak decidedly about it, and say that it is an illegal act, and that veterinary surgeons must drop it; but ninety-nine out of a hundred veterinary surgeons think that docking is not cruelty if properly performed. There have been several cases tried and referred to a superior court. Professor Axe says it is not cruel, and Professor Pritchard says it is cruelty. I have publicly stated that I will never appear in the witness-box against a veterinary surgeon unless there is gross malpractice. I do say this, that it ought never to be performed except by a duly qualified man. (Hear.)

The CHAIRMAN, in conclusion, proposed a vote of thanks to Mr. Greaves for his very interesting paper.

Mr. HARDY seconded this resolution, which was carried by acclamation.

Mr. GREAVES, in returning thanks, said he only wished he could be of greater service to his professional brethren than he was. To those who had given him their votes in the recent election he returned thanks. He had been placed third on the list, and for placing him in that honourable position

he was very pleased to thank them ; and also for the kindness shown to him that day.

On the proposition of Mr. HOOL, seconded by Mr. GREAVES, a cordial vote of thanks was passed to the President, and suitably acknowledged.

F. SPENCER, *Hon. Secretary.*

ROYAL COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the above Association was held at the Clarendon Hotel, Oxford, on July 25th, 1884, G. A. Lepper, Esq., President, in the chair.

There were also present Messrs. Flannagan and Wheatley, Reading ; Walker and Verney, Oxford ; Simpson, Maidenhead ; Jas. East, Aylesbury ; Irving, Chipping-Norton ; Bull, Deddington ; Howard, Newbury ; Wilkins, Lambourne ; Simpson, Witney ; Castle, Thame ; Mellett, Jun., Henley-on-Thames ; and Kidd, Hungerford, Hon. Sec.

There were also present as visitors : Dr. Sankey, Mr. McNeil, banker ; Mr. Irwell, Wadham College, Oxford ; and Mr. Page, Jun., Banbury.

Apologies for non-attendance were received from Messrs. Wragg, H. L. Simpson, Drewe, Hanks, Joseph East, H. G. Lepper, T. W. Lepper, and Jas. Darling.

The minutes of last meeting were read and confirmed.

The following gentlemen were unanimously elected members of the Association, viz. :—Mr. Sydney H. Slocock, M.R.C.V.S., Hounslow ; Mr. Francis Walker, M.R.C.V.S., 1st Life Guards ; Mr. J. A. Rostron, F.R.C.V.S., 2nd Life Guards ; Wm. East, M.R.C.V.S., Princes Risborough ; Albert Simpson, M.R.C.V.S., Witney ; Fredk. P. Bennett, M.R.C.V.S., Banbury.

Mr. J. P. S. WALKER, of Oxford, read a paper on "The Docking of Horses and Mutilation of Animals," in the course of which he said :—I think the veterinary profession ought to stand by its motto of "Science, humanity, and utility," and chopping off horses' tails is neither a scientific, humane, nor useful operation, if it can be classed as an operation at all ; it certainly cannot be called a surgical or scientific one, as no knowledge of anatomy or surgery is necessary for its performance, as the merest tyro professes to be an expert at it, and can and does perform it. Very often the "farrier" or "empiric" is preferred to the professional man for the purpose, and has quite as much success, so that anatomical knowledge is out of the question altogether. It is not a scientific operation, for science never will condescend nor debase herself to operate, except for the purpose of relieving pain or curing disease ; and neither of these objects are ever claimed for it by its most strenuous supporters. Mr. Stanley, of Warwick, in his paper said, "that hundreds were docked by a cut of the knife, standing without restraint of any sort." Where, then, I would ask is the scientific and anatomical knowledge required for its performance ? Neither can it be classed as a humane operation, because it is impossible to associate any feelings of tenderness or benevolence with the forcible removal of any part of a healthy subject. The great majority of thinking humanity scorn the abomination, and it cannot be associated with humanitarian feelings. I shall show later on that it cannot be defended on the score of utility. So that, taking it altogether, I do not think it ought to be called an operation, but a useless mutilation, quite undeserving the attention and countenance of a professional man. For, if I understand it aright, ours is a noble profession, and those who teach and practise it ought to realise that it is so, having for its aim the healing of disease and alleviating the sufferings of the dumb animals ; or, as the word veterinarian means, one skilled in the diseases of domestic animals, and not the mutilation of them. Those who condescend to such practices, and pander to the depraved appetite of individuals or fashion, break

covenant with their patients, and travel beyond the bounds of their legitimate calling. This perpetration of cruelty assuredly does not belong to the healing art, and if it is to be continued, it ought to be left in the hands of outsiders, and not be countenanced by those who have studied for the purpose of relieving and preventing animals from suffering. Although this subject has been associated with our profession, I say that it is not a professional question at all (but is outside altogether), and ought to be relegated to the quacks and charlatans, to those who are irresponsible for their actions and reasoning. Let us be inspired with a higher and nobler spirit towards the creatures whom we profess to befriend and alleviate. Whom should we expect to do so, if we, who profess to be the friends and alleviators of animals, do not come forward and protect them from unnecessary cruelty and despoliation? We must be sinning against law and conscience, and are unworthy of the name we bear. If there were no other argument against this practice than that the Creator of the universe made all things well and wisely, it ought to be sufficient for us, who have learned to admire and appreciate nature in its perfect and original state; the nearer we can approach to this, and the more we imitate and try to keep animals in this condition, the more likely are we to attain the object of our pursuit and success in our profession. We rarely find that nature has bestowed things in vain, and to say that the horse has been furnished with too long a tail is equivalent to insulting and dictating to the Almighty, if it were possible for finite creatures, such as we are, to do so. People who do not pretend to a taste in other things pretend to have distinct views on this subject, which are not shared by nature, and they proceed to rectify her mistake, not by the gentle methods which she herself adopts, but with the blood and iron of despotism. Art may amend nature, but it must do it by adopting nature's gradual processes, and calling her forces into operation. If short tails were the best arrangement, for certain horses, nature would have found it out before now, and varieties would have arisen and would perpetuate themselves, which would not need the intervention of the farrier's or veterinary's instruments of torture. On the contrary, although we find almost infinite variety in other respects amongst the equine race, yet with regard to this particular feature there is universal uniformity. Therefore, making exception of all cases of malformation and disease, I maintain that all mutilations, of whatever kind, are inadmissible, and ought to be avoided and prohibited. It is only where these exist that amputation of organs, or part of them, can legitimately be allowed or permitted, more particularly by a professional man. If our profession was true to its interests and principles it would discountenance this practice altogether, when the public would very soon learn that it was no part of our duty to cut and carve animals, to suit the fancy and fashion of a depraved appetite: and then it would very soon fall, to be recorded amongst the doings of the past. But the individual members of the profession cannot be saddled with all the blame (not even the half of it) for its continuation, because in the great majority of instances they have been taught to perform and believe in it, so that the teachers and schools must bear the lion's share; for, if all of them were actuated with the same spirit regarding this question as the one under whom I studied, the late Professor Dick, I venture to say that discussion now would be unnecessary. For this alone, if for nothing else, I respect and revere his memory, and to his honour it should be recorded and written in letters of gold that he never would countenance or sanction any surgical interference with such a useful and ornamental organ as the horse's tail, except in cases of deformity and disease. A certain amount of responsibility must rest upon the owners of horses who insist and require their horses to be docked; so that if the schools, instead of teaching, would discourage this unnecessary interference with animals, the profession would cease to practise or countenance it. Owners

would very soon appreciate the kindness ; the cruelty would be abandoned, and all nature would rejoice at the happy result. I shall now proceed to notice some of the so-called arguments, if such exist, in favour of this mutilation. I have looked in vain for any such in the reported speech made by the mover of the resolution in its favour at the Council meeting, and although the resolution expressed "that there are many circumstances which render the operation necessary," yet he failed to enumerate any of them, the only semblance of argument being that "veterinary surgeons had been taught that it was a necessary operation." Of course, the fact of their being taught so does not justify the practice, because people have been taught many things which have been found to be wrong ; and he adds that "it was practised before the profession existed," thus showing that it was not of professional origin, but as I said already a barbarous practice, belonging to the dark ages of superstition and ignorance, and quite unworthy to be classed amongst the operations of our time. But in order to answer or combat the pleas which have been urged in its favour, I shall first notice the "no-pain one." Can it be believed that a professional man could have the audacity to say that no pain is produced when any organ of a healthy body is cut away, without the use of an anæsthetic, and more particularly an organ, such as the tail, which is in direct communication with the sensorium? Taking into account the several parts which have to be removed, the assertion is too utterly absurd for discussion, not to mention the roasting process which follows the removal ; and supposing that the mutilation has been performed under the influence of an anæsthetic, it is impossible that the parts can heal up without subsequent pain and discomfort, under the most favourable circumstances and conditions. The slightest scratch on the finger gives rise to pain, often to great inconvenience, and sometimes to serious consequences, and all these would be proportionately increased if the finger were removed at the joint. So must it be with the horse's tail, as witness the number of cases of sloughing, gangrene, tetanus, agony, and death which supervene upon this so-called "simple operation." I have yet to learn that the horse's tail is devoid of feeling. On the contrary, in some instances the pain has been so acute, and the impression produced so great, that the animal remembers it ever afterwards, and is always frightened of its dock, which it never would be had it not been docked, and this is instanced in the harnessing of some horses, and their travelling faster afterwards in a state of fear. As I do not think that any one here will seriously maintain that pain is not produced, both at the time of operating and subsequently, it is unnecessary to pursue this plea any further, and may be held as conceded. Next, "Is it necessary?" If it were necessary it would be more universally adopted than it now is. And if there were sufficient reasons to justify the necessity they would be more patent, and commend themselves to men's minds. We are told that "necessity is the mother of invention." True, but all inventions have not been found to be beneficial, and this is one of those which was not invented for the purpose of benefiting the animal, but to please the eye and fancy of the individual, and therefore cannot be held to be necessary or expedient. Mr. Stanley says, "we are justified in painful operations, if in our judgment the object is to benefit mankind." I hold that the animal to be operated upon has as great a right, if not more, to be consulted in regard to the result as the individual who institutes or performs the operation, and I am quite sure, if it were possible to get the voice of the animal creation upon this particular point, they would unanimously declare against its being necessary to their well-being. But it is said to be necessary in order to fit animals to certain conveyances, and prevent their tails coming in contact with them, and the reins, etc. This might be answered by saying that horses were made before vehicles, and that the latter ought therefore to be made to fit the former, and

not *vice versâ*. It is not asserted that all horses are suited to all kinds of work, any more than that all men are fit to be veterinary surgeons ; so that if he is unsuitable for one kind of work he ought to be put to another, which would be more in accordance with the dictates of humanity than to try and make him suit by removing part of his body for this object. If these appendages are ill adapted to the work which the horses are set to do, or the conditions in which they are placed, the presumption is against setting them to do that work, or placing them in those conditions. The same argument might be used against a horse's legs being too long, and ought to be shortened, or that a man's ears (without insinuating that he was an ass) were too long, coming in contact with his hat, and ought to be shortened to make way for the hat. It is further said to be necessary to prevent a horse switching his tail, and so bespattering his driver or rider with mud, etc. ; but all that is required for this purpose is merely to deprive the tail of part of its hair, which will not pain the animal, and would only be at most a temporary punishment. Again, quoting the same author, he says, "Experience has taught men that the long tail of his noble favourite is useless to the horse and a nuisance to the owner." I would like to know who made the discovery, and why he does not advocate its removal altogether? It must be borne in mind that the great majority of animals are docked when they are young, and before they are put to any kind of work, so that the plea of necessity can rarely if ever be maintained, as the necessity had not then arisen. It is also done to improve the animal's appearance, and render him more valuable. This, of course, is a matter of opinion, and cannot be dealt with as matter of fact, and is therefore irrelevant to my case. It is difficult to see how we can improve upon nature's works, so long as they are in a perfect state ; as it is only by imitating nature, and in making a near approach to it, that we are considered to excel in works of art. So that when an animal is said to be improved in appearance by taking part of it away, it must be said to be an abnormal taste. The very fact of an animal having part of his tail cut away, cannot be held to have increased his value, as it does in no way add to his strength or powers of endurance, the improvement being only imaginary, so that, apart altogether from the fact that we are not at liberty to cut and carve animals to please our own fancies, nor to torture them for the purpose of profit, it cannot therefore be held to be necessary in the interests of the man or the animal either. It cannot be supposed for a moment that this organ was given to the horse to be chopped off at the will of man. No ; it was given for wise and beneficent purposes, such as self-defence and protection against the attacks of enemies, as flies and insects, and it is just placed in such a position as best to supply this, at the part where the corrugator muscle is most deficient, or inconvenient for the head to reach. What an amount of suffering and annoyance the animal has to submit to when deprived of this organ, and turned out to graze ! It is also given as a covering for tender and delicate parts, which ought not to be exposed to view, and it must be considered a great ornament when in its entirety, displaying such perfect proportions and beautiful curve, with flowing hair, forming altogether an unique termination to the animal, which is quite destroyed in its mutilated form ; its graceful appearance disappears, and remains a miserable stump, as a standing monument and protest against such needless interference with a perfectly constructed animal. I have no doubt but it plays an important part in the animal economy, such as maintaining the equilibrium of the body in progression and turning, etc. ; this is the horse's rudder. If we deprive a boat of its rudder, we cannot guide and turn it as we desire ; so with the horse : if we remove his tail we must deprive him of a certain amount of power for guiding and turning his body. It was at one time thought that it strengthened the horse's loins to remove

the tail, but I think this idea is pretty generally departed from now, as science has failed to explain the reason why. Another excuse put forward is that we are asked by our clients to perform this operation, and that if we won't do it, others will ; possibly so. But then that is no justification of the thing itself. We have to do with reasonable beings, and if we, instead of quietly complying with their desire, would explain to them that it was no part of our business to dock horses, that it was injudicious to do so, and at the same time a dangerous operation, they would generally be convinced that we were advising them for their own interest, and would not insist upon having it done. It is urged by some that if we submit to be stopped from performing this operation, it will only be the inserting the thin edge of the wedge, which will ultimately stop us from others also. In answer to this, I would say that there is no force or consistency in this argument, and that not only is the thin edge of the wedge inserted already, but it is half driven home, so far as this question is concerned, for the public have taken it up, and it is impossible to stem the flow of public opinion ; it is sure to prevail in the end, and the sooner the profession makes up its mind to that the better. We are too weak a body to wage war against the public, and especially in this matter it would be unwise to do so, for we would only be heaping contempt, contumely, and disgrace upon ourselves, degrading and lowering our profession in the eyes of the world ; instead of elevating it, and doing that which we should most desire, viz., to inculcate a more humane feeling, and advocate a more enlightened and beneficent mode of treatment of the lower animals. Now, gentlemen, to recapitulate the various points touched upon. I hope I have made intelligible and clear to your minds, and that you will all agree with me, that the operation of docking is a useless operation ; that it is unnecessary ; that it is dangerous ; that it disfigures the horse ; that it is a barbarous practice ; that it is unprofessional ; that it is unscientific ; that it is unjustifiable ; that it is illegal, and ought, therefore, to be abandoned.

Mr. J. F. SIMPSON, of Maidenhead, congratulated Mr. Walker for having taken the proper course to convince them—namely, by argument of the views he held : the course which had been hitherto pursued with reference to this subject was the brutal one of compelling those who disagreed with a very small minority of the profession to appear as defendants in Police Courts. The members of the veterinary profession, he maintained, were a humane body of men, and the best friends of the Royal Society for the Prevention of Cruelty to Animals, and the Society had been badly advised when they made an attack on the veterinary profession in respect to the operation of docking. He congratulated the Association on having taken the initiative in condemning the course taken by certain gentlemen in the profession, by unanimously expressing their approval of the motion of his brother—a motion which was carried at an exceptionally large meeting of the Council of the R.C.V.S. ; the example of this Association had been followed by every Veterinary Medical Association in the kingdom. The question, "Is it an act of cruelty to dock horses?" he maintained, had been answered by the profession in a manner worthy of itself, and in the face of such evidence as the resolutions of the Council of the College and the Veterinary Medical Associations throughout the kingdom, no conviction is again likely to be recorded against a veterinary surgeon for performing the operation, provided of course that the operation is skilfully performed. He held that in very many cases horses which were unsafe to drive with a long dock, were converted into useful and quiet animals by the operation. In order to domesticate animals, it was often necessary to do certain things which at the outset caused fear, inconvenience, and in some cases slight pain ; he referred to the shoeing of a restive colt for the first time, and argued that

the terror and discomfort which some of them endured amounted to pain; but, he asked, would any one in his senses condemn shoeing because of this? If not, why should docking be condemned if it will convert a useless horse into one which will serve its master for many years? he was no advocate for indiscriminate docking to satisfy the taste of every groom into whose care the horse might be placed, but he disapproved of the unnecessary interference with veterinary surgeons while exercising their best judgment in matters of this kind. He disagreed almost entirely with the views of Mr. Walker, as he believed every one else present did; at the same time he would again compliment him upon the way he had selected to give expression to his views. (Applause.)

Mr. LEPPER, Mr. FLANNAGAN, Mr. IRVING, Mr. CASTLE, Mr. VERNEY, and Mr. KIDD having criticized the paper, and argued in favour of the operation,

Dr. SANKEY asked if the operation was legal or illegal, if it could be performed by any, and if it could be performed on horses at any age?

Mr. WALKER replied to the former by referring to the number of convictions which had taken place; he replied in the affirmative to the two latter questions.

Mr. SIMPSON proposed a vote of thanks to Mr. Walker for the paper he read to them.

Mr. JAMES EAST seconded the proposition, which was carried unanimously.

Mr. WALKER proposed a vote of thanks to the Chairman, which was seconded by Mr. CASTLE, and unanimously agreed to.

The next meeting will be held at Aylesbury. H. KIDD, *Hon. Sec.*

SCOTTISH METROPOLITAN VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Society was held in the pavilion in the Highland and Agricultural Society's show ground at Edinburgh, on Thursday, July 24th. The President, Professor Walley, occupied the chair.

There were present—Principals Walley, Williams, and McCall; Professors Townsend, of Ohio, and Baird; Messrs. Rutherford, Finlay Dun, Storie, Hallen, H. Thompson, Bell, of Carlisle, A. Robinson, Cameron, McCallum, Hutton, Fairburn, Pow, Potts, Spreull, Cassels, Smart, Ferguson, Brock, Riddock, Burnett, Irving, T. Connochie, Fingzies, Young, Boyd, Clark, Cunningham, A. Grey, Walters, A.V.D., Fenton, A.V.D., Jacob Wilson, member of the Council of the Royal Agricultural Society, Mr. Jenkins, Secretary of the Royal Agricultural Society, Mr. Mulcaster, of Burgh, Mr. Usher, of Stodrig, the Secretary, and others.

The minutes of the previous meeting were read and approved of.

The President proposed that Messrs. Hallen and Lothian should be elected members of the Society; Mr. Borthwick seconded the motion, which was carried.

President WALLEY, in presence of a large attendance, delivered the following address on

The Relation of Veterinary Medicine to Agriculture.

In dealing with a subject such as that upon which I have chosen to address you to-day, two things, at the outset, require to be made clear. The first is the right of the person who addresses you to deal with such a subject; the second, that there exists a relation between the two professions. If, gentlemen, the being born in the bosom of agriculture, and reared in one of the best agricultural districts in the kingdom, or, I may say, in the world, and if an acquaintance with veterinary medicine extending over a period rapidly

approaching three decades, establish my right, then may I, without diffidence or arrogance, assert my claim to the position I have to day taken up. And if, in the marriage ceremony, it is a truism that man and woman "become one," it is a greater truism that veterinary medicine and agriculture are one and indivisible. Man and wife may be, and frequently are, divorced. Veterinary medicine and agriculture can never be so. Even though you agriculturists chose to do without us, you would yourselves have to practise our art or suffer serious losses. Side by side, age after age, have the two professions grown up and advanced. Shoulder to shoulder, from generation to generation, on and on in the distant future must they still continue to advance, or otherwise their fall must be conterminous. It is yours to produce, ours to conserve the health and to preserve the lives of animals, though we may sometimes get the credit of destroying them. Yours is a noble work; is ours less so? If in your operations you do all in your power to supply the teeming multitudes of your fellow-creatures with animal food, we equally endeavour to preserve that food in a condition fit for the consumption and nourishment of the human frame. If it is to your advantage to place the animal creation under conditions favourable to its development and comfort, it is our province to mollify the pains which your domestication inevitably originates and establishes. If your prosperity is a necessary preliminary to ours, the advances we may make in our profession, we may confidently claim, will increase your gains. And though we may, metaphorically speaking, live upon your misfortunes, remember we are, after all, like many other things in this sub-lunar sphere, "necessary evils." If your lives are spent, not only in the multiplication of animal life, but in contemplating its growth and perfection, we too have an eye for the beautiful; we too can admire grace, symmetry, and beauty of form in the brute creation. If from the agricultural profession our ranks are frequently recruited, we too can show you examples of veterinary surgeons becoming successful breeders and exhibitors of domestic animals; and, indeed, I may ask, who more fitted to do this, provided the means are forthcoming, seeing that the veterinary surgeon is so intimately acquainted, not only with the anatomy and physiology of animals, but with their habits and requirements also? Again, if the ranks of the agricultural profession are thus sometimes recruited from those of the veterinary, how much more frequently is the proposition reversed? And who more fitted, given the necessary brains and education, to swell our ranks than the agriculturist? He has, if he chooses to avail himself of it, the best possible opportunity of learning the first great lesson in the diagnosis of disease, viz., the conditions which imply the existence of health. From earliest infancy you have opportunities of observing the natural conditions under which animals are ushered into the world, and by which they develop and ultimately fulfil the objects of the brute creation. Long before I was in my teens had I frequently to give a hand—where that useful appendage of the shepherd's body was too massive—in assisting the lambkin into the world, and also to assist in the treatment of animals generally. Was this experience detrimental to my progress in the profession I was afterwards destined to practise? Did it render me any the less capable of divining when and where disease existed? No, gentlemen, it has, on the contrary, frequently enabled me to detect the fell destroyer in his earliest infancy, and the experience gained then has been of the greatest possible assistance since in helping me to master the secrets of unhealth, and to do, I trust, some little good in the profession which I was led to choose for my life's work. If you discover the secrets of zoology by breeding, rearing, and feeding, we none the less surely master them by the study of disease as well as of health. If you desire to improve the breeds of the animals from which you obtain your sustenance, we, if you will listen to us, are in a position to give you valuable aid, to warn

you of the quicksands which lie thickly in your path, and to assist you in avoiding the rocks upon which many agriculturists become wrecked. By the sweat of your brows are animals brought into the world and nourished and retained therein ; by the sweat of our brows are they often prevented from passing out ; and the analogy may be driven home even a little more closely, seeing that we frequently have to bring the young into life and light when your efforts in that direction have proved futile. If you suffer from bad seasons, from absence of sunshine, from deluge, from death, we suffer equally, for from your emptied purse an answering echo comes from ours. If, in your calling, many privations have to be endured, culminating in much loss and much disappointment, have we not equally to suffer? What about our night rides, our anxieties and cares for the welfare of your property, the expenditure of our means, of our strength both physical and mental, the using up of our horseflesh, that we may benefit and assist you? Are we always adequately remunerated? If you fail, we suffer too ; the ship in which you sail is the one in which we alike embark ; you sink, many of us go down in your company ; swim you, and we may likewise float. If we are necessary evils, is it not a fact that we are often welcome visitors? Where mutual respect and confidence exists between the agriculturist and his veterinary doctor, are not the visits of the latter a welcome relief from the *ennui* and sameness of his every-day life? It is not, perhaps, quite within my province to consider the why and the wherefore of the serious depression which has come upon agriculture during the past few years; but seeing that this depression so vitally affects the wellbeing of the veterinary surgeon, a few remarks on this head may not be considered out of place. Neither you nor I can alter the course of the seasons ; we cannot propitiate the gods and command more favourable barometrical and thermometrical influences ; but we can accommodate ourselves to circumstances. When agriculture prospered, did its devotees look beyond the "present"? Were they not so elated by the then existing prosperity as to forget that a "rainy day" might come? Cast your memories back for the short space of two or three decades, and ask yourselves did you then contemplate the time when the present condition of things would come into existence? Were not farmers much in the same position as colliers at a not very distant period? Did they not think that their elysium upon earth was a realised fact? and, as a consequence, did not veterinary surgeons also take the flattering unction to their souls that bad times would "come again no more"? But alike to us and to you came a rude awakening. The dreaded Rinderpest overstepped the "steppes;" it stalked red-handed and death dealing over our hills and our dales; it decimated our herds; it brought sorrow and destruction upon you and upon us. Though, doubtless, we profited by it temporarily, we suffered from its ravages equally with yourselves in the end. The dreaded scourge was followed by bad seasons, foreign competition, and high rates of wages; and if these affected you we did not, we do not now, escape scatheless. Though we may not suffer directly from foreign competition in the breeding and rearing of animals, we suffer from a competition of an equally deleterious character—the competition of the quack and of quack remedies. The Cattle Plague was the progenitor of numerous quack remedies ; it was followed by such a period of depression as to lead the agriculturist to trust to those remedies in other and different cases, in order, as he thought, to save the expense of sending for the doctor, and thus, perchance, the disease was cured at a slight expense ; but more frequently the case was rendered (and often it is so now) incurable by the valuable time lost in the misapplication of what are, even at the best, but temporising measures. A rose, it is said, "would smell as sweet though it were known by any other name;" but if this is a truism it does not hold good in the relation which exists between

the veterinary surgeon and the agriculturist, for a bottle of embrocation, or a dose of medicine supplied by an ordinary individual like myself does not possess half the charm to the stock-owner as does that prepared by some unknown ignoramus who has mastered the art of "gulling the public," and of dinning high-sounding designations into their ears. But apart from this, and more seriously, there has been at work another and far more important influence in bringing about agricultural, and, consequently—in rural districts—veterinary depression. I allude to the great tendency which, amongst agriculturists, has, within a few years, grown so much of enlarging their borders to an unmanageable and unreasonable extent. This tendency had its birth in my earlier days; it has gone on steadily increasing. In many districts the small farmer, the ancient yeoman, is "a thing of the past." Tilling the soil by his own hand, and with the aid of his own family, owing no man anything; happy in the mutual help of his own people, content with moderate gains and a moderate competency; frugal, painstaking, and easily satisfied, he has been gradually replaced by an agricultural aristocracy which has had to trust to the hireling and to the stranger for its manual help, and has, as a consequence, either prospered apace, or come down with a sudden and a woeful crash. It would be idle to say that our profession has not suffered by this revolution; the rural veterinary surgeon knows better. The working farmer is his best client, because he cannot afford to ride hobbies, or to risk the loss of a valuable animal upon the hazard of such a die as empirical doctoring. But while I say this, I must at the same time acknowledge, and I rejoice in that I am able to make the acknowledgment, that in many ways our services are more appreciated by agriculturists than they were in days gone by, and that the feeling now largely prevailing amongst the agriculturists is that in the veterinary profession they have a very present help and protector. There is, gentlemen, another relation in which we stand to each other, viz., that neither in your case nor ours have we received in our onward progress any extraneous help. Such progress as has been made has come from our own internal and individual efforts, and that inherent vitality which has enabled us in the past, and which is even now assisting us, to do battle with difficulties and to override obstacles, has still a vigorous existence. No State aid of any importance, so far as I know, has been given to agriculture. None has been afforded to the veterinary profession, at least in this generation; and while other arts and professions have received help of a most substantial nature, we have been left to our own resources, and in one notable instance (the Miss Dick bequest) a valuable revenue has been diverted from its natural channel to benefit indirectly a profession whose resources are a thousand times greater than ours, and the incomes of whose teachers are relatively as thousands are to hundreds as compared with ours. I do not know whence the influence came that effected the diversion to which I have alluded, but I hope the University authorities will do the *amende honorable*, and refuse to profit by the earnings of a smaller and poorer profession. If, however, we receive no State aid, we have frequently and for many years past received both moral encouragement and material assistance from the Highland and Agricultural and kindred societies. Gratefully do we acknowledge, and most highly do we appreciate this help. While speaking of the drawbacks in agriculture, there is one important subject upon which I may be permitted to speak to you, viz., the prevention and suppression of disease, and in doing this, I shall deal not only with imported but with indigenous maladies also. That we have to thank foreign importers for some of our bovine and ovine scourges nobody can honestly deny. Their introduction has been a natural sequence of importation, and though, so far as I can see, it would be scarcely possible for this beef-eating country, under present conditions, to grow all its own stock, we need not run the risk of introducing disease by the importation

of live animals from unhealthy countries or parts of countries. In saying this—a reiteration of a published statement made by me in *Bovine Scourges*, p. 48, 1879—I must at the same time confess that we are not always the losers by foreign importation, and that, indeed, we are often greater losers by prohibition, as, for example, in the case of Dutch cows—animals which have no equals in this country for dairy and general purposes. A statement has of late been placed prominently before the agricultural and veterinary professions to the effect that there is a natural tendency to periodicity in zymotic diseases. While to some extent I agree with this statement, and, while in 1879 (*Bovine Scourges*), and even much earlier, I have taught the doctrine of "Periodicity in Disease," I must, in reference to Foot-and-mouth Disease and others, dissent from the doctrine in a great degree, or can only accept it with certain reservations. Those who promulgate such a theory overlook one important fact—viz., that there can be no periodicity of disease when the one necessary factor, disease virus, does not exist. We have abundance of proof that many infectious fevers gain extraordinary vigour every three or four years, or sometimes oftener. We see it in Typhoid and in Scarlet Fever, in Small-pox, and similar affections of man. We see it in Influenza and Strangles in the horse, and in Distemper and Rabies of the dog; but will any one assert that in any one of these cases the active principles, the *vires* of these diseases, have ever been effectually destroyed, or have been starved for want of pabulum? The germs of these diseases are ever present with us, and only require that a concatenation of circumstances favourable to their revivification and multiplication shall arise, and these favourable circumstances are forthcoming every now and again in these barometrical and thermometrical influences which exist in all pre-eminently epidemic and epizootic years. The same law holds good in the case of Pleuro-pneumonia in cattle, but it does so by virtue of the operation of the same circumstances. Has not the history of the recent outbreaks of Foot-and-mouth Disease in this country disproved such a statement? Where would periodicity have come into existence if, after we had over and over again succeeded in suppressing the malady, fresh doses of poison had not been repeatedly introduced from external sources? Do you fear this periodicity to-day? I confess I do not, providing we have no fresh introduction of the malady from without. I am quite aware that it may be said we have been especially fortunate in our efforts to suppress these outbreaks. I admit that we have; but did we wait for fortune to come to us? No! we wooed the fickle goddess by using the means which all possess to command her good graces, and we have been successful, and have been able to show our friends across the Border what can be done by united and determined effort. We of the veterinary profession rejoice that we have had a hand in producing the grand result, and we unreservedly acknowledge that our advice has been as freely acted upon as it has been willingly given; and I have no hesitation in saying that every zymotic disease could be dealt with in a similar manner if radical measures were efficiently and vigorously enforced, and in my opinion there are no measures which will adequately meet such cases short of universal compulsory slaughter with Imperial compensation. It is contrary to human nature to assume, as the Privy Council seems to do, that local authorities will vicariously sacrifice their means for the good of their neighbours. As we stamped out Foot-and-mouth Disease in 1882 in this city in its very inception, so can it be suppressed in other districts, and so may Pleuro-pneumonia be suppressed. The great thing in dealing with our enemy is not only to have measures for fighting him prepared in case of his putting in an appearance, but to be ready when he does show himself to put them vigorously into force. The necessity and value of this was never more forcibly impressed upon my mind than it was at the time of the intro-

duction of Pleuro-pneumonia into Liverpool from America. In the course of a discussion on the subject, carried on by a representative of Canada and of the U.S.A. respectively, the former said—"We have been watching for this, my friend; we have had everything cut and dried for months, and within seven hours after the fact was made known in Liverpool the measures previously devised were put in force, so that not one hoof could cross our borders from the States." The remark was wound up very suggestively by the taunt (alluding to the difference between Canadian and American time), "I guess, my friend, we are five hours ahead of you." And we may say without egotism that we have been five hours ahead of our neighbours, and that, too, by employing the same means as they possess, but employing them vigorously and fearlessly. There is usually too much red-tapeism, and not sufficient individual responsibility, with a want of individual executive power. One example as to the way in which local authorities in England sometimes do their work I will relate. It happened several years ago that I was staying for a few days with a very old professional friend. On a particular Sunday an outbreak of Pleuro-pneumonia was reported to my friend, who was inspector for the district, and he asked me to accompany him on his visit of inspection. I did so: we found two cows in an advanced stage of the disease. After examining them, I said to the inspector, "What are you going to do?" He said, "I can do nothing until I receive instructions from headquarters." These were more than twenty miles away. There was no sitting executive committee of the local authority; a meeting had to be called to consider my friend's report (transmitted through the police), with the result that four days elapsed before the animals in question were slaughtered and the infecting centre destroyed. One thing I do not understand in reference to the supply of animals is this, that while agriculturists in this country object so strongly to foreign importations, they themselves do nothing to obviate the necessity for this in the way of home breeding and rearing. Granted that every farm is not suited for breeding purposes, there are few of which it can be said that they are not capable of rearing stock, especially with the aid of a few nurse-mothers and the artificial nutrients which can now so easily be obtained. It is a matter of astonishment to me (of weekly recurrence) that while the in-purchase of stock is such a serious matter, so many young animals (many of them a few months old only) should be exposed in our marts and markets for the sole purpose of slaughtering, instead of being bought by farmers for rearing and feeding, thus saving an enormous outlay, and materially diminishing the risk of introducing disease. Another matter which equally astonishes me is the carelessness which is exhibited by many in their dealings with animals suffering from sporadic diseases; not only do breeders allow sheep suffering from such diseases as "Rot" and "Sturdy," and lambs the subjects of "Swing-back," "Rickets," "Joint-ill," and "Louping-ill," to drag out a miserable existence, terminated only by a still more miserable drive to a mart or an abattoir; but very frequently they do not adopt any measure to prevent the recurrence of such attacks, by altering their system of management and by seeking the aid of the veterinary surgeon. I am asserting a fact when I say that hundreds of animals are sacrificed every year by supineness and ignorance, and that while agriculturists pay great attention to the chemistry of their profession, they are, as a class, utterly ignorant of the physiology of the farm; and that, while they seek the aid of the veterinary surgeon for curative purposes, they almost entirely overlook his prophylactic functions. Another matter which often puzzles me is the utter indifference shown in this country to the cultivating of every other breed of horses than the Clydesdale. Surely the breeding of lighter classes of horses cannot be so unprofitable as that it should be so entirely neglected! How is it that one finds it so difficult

to pick up a decent cob or roadster, and when they are found, that the price is so disproportionate to that of other animals? What about good serviceable van and carriage horses—a class of animals one seldom sees? I cannot help thinking that this decline of taste for the breeding of such animals, especially the former class, is not favourable to the development of the manhood or the manliness of the country. Perhaps the explanation is to be found largely in the fact that we are rapidly becoming a bicycling and tricycling race, from the former of which machines I pray to be preserved, and from the latter also until I grow old. Certainly a ride of five miles on the back of a horse is worth a score on the cross-beam of an automaton. I have said nothing as to hunters, for Scotland is pre-eminently a non-hunting country, and the supply is always good and moderate in price; but even in the breeding of this class of animals our young men might find both pleasure and profit. There is, in my opinion, only one maxim which requires to be impressed upon intending breeders of animals, and that is to *breed sound* and to *breed true*. That this maxim is too little acted upon, is proved every day in your Clydesdales; animals in which a grand top often proves more attractive than sound timber, the admirers of the former overlooking the fact that without the latter the Clydesdale is like a wonderfully furnished carriage on rickety wheels, and that as with the maker of the rickety carriage, so with the breeder of the unsound horse, the defect is likely to bring him to grief at any moment. Believe me, gentlemen, when I say, from a large experience that if there is one thing more calculated than another to bring the Clydesdale down from his high pinnacle, it is this want of care in breeding; and as to you I have only to say that it is the rift in your lute which may spoil its melody, the hole in the bottom of your ship which may cause it to sink, the fissure in the banks of your reservoir which may some day lead to its being emptied. And if the warning is required in respect of your horse-breeding, it is not the less required in regard to your cattle-raising. In your Highlanders, in your polled Angus, in your Galloways, and to a slightly less extent in your Ayrshires, you have a succession of breeds of wonderfully sound constitution, and remarkably free from the scourge of scrofula, which has eaten, and is now eating, the heart out of some of our best shorthorn strains; but while you have guarded against this "Charybdis," you are, I fear, running the risk, in some districts at least, of finding your "Scylla" in another disease, viz., "Canker of the Tongue," "Actinomycosis," or "Ray-fungus disease." In conclusion, allow me to hope that it may be our lot to see the day when agriculture will again prosper. Perhaps some of you may be inclined to say, "Let it first live." Well, be it so; let it first live, then prosper, and may its mutual help—veterinary medicine—prosper with it. It is not likely that there is a Methuselah amongst us; if I thought so, I would say may one at least amongst us live to see the bi-centenary of the Highland and Agricultural Society of Scotland; but I can hope that when it comes it will be seen that greater progress has been made in the second than has been attained in the first century of its existence.

Mr. JACOB WILSON, Woodhorn Manor, in moving a vote of thanks to Principal Walley for his excellent address, said he was entirely at issue with him on two or three points, and especially with regard to his remark that the tendency of agriculturists at present was to encourage quack doctors instead of professional men. His impression was that the veterinary profession never stood so high in the eyes of agriculturists as at the present moment. A bond of union had been cemented between the two professions, more especially since the unfortunate introduction of Cattle Plague into this country. He quite agreed with Professor Walley's remarks as to periodicity, and expressed his belief that nineteen times out of twenty they could directly

trace the origin of the disease. The Government of the day had, he thought, been wise in its generation in carrying through the bill which had recently been passed into law, and he trusted it would be the means of removing from their midst one of the causes which had brought about agricultural depression in recent years. He was rather struck with Professor Walley's remarks regarding local authorities. He gave every credit to the Scottish authorities, and he believed that they in England could, with great advantage, imitate what had been done. From whatever cause it might be, the fact remained that in Scotland they had been able to exterminate a disease which in England, he was afraid through greater laxity, had been allowed to decimate their flocks and herds. Referring to the decrease of the disease, he stated that he had received a telegram the previous night from the Veterinary Department, informing him that within the last two weeks there had been only one fresh outbreak of the disease in England. As to the means for stamping out the disease, he was inclined to favour the mode that had been adopted by the Hereford authorities, of slaughtering all the animals that were affected; but that could only be done under two conditions—on the introduction of the disease, or when there were very few animals remaining.

Mr. WALTERS, A.V.D., seconded the motion, which was cordially adopted. After a few remarks from the President, a hearty vote of thanks was given to the Highland and Agricultural Society for the use of the pavilion, and the meeting terminated. T. H. LEWIS, *Hon. Secretary.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 140.)

The symptoms must, therefore, be the guide in the selection of the remedy; this, however, does not make them the object of the prescription. I may remind gentlemen who are very fond of adducing this same argument against the law of similars, of an instance where one of the fondly so-called orthodox school made a fatal error, due in reality to nothing short of pure symptom treating. I do not care about using sharp-edged tools in discussion, but when they are resorted to by those who hold different opinions to myself, I am constrained in self-defence to occasionally fall back upon them. I am indebted to Dr. Carroll Dunham, in his article on "The Therapeutic Law," which precedes his lectures on materia medica, for the following rather interesting circumstance; referring to the objection to symptom treatment, he says: "The objection of which we are speaking, viz., to the treatment of symptoms, is well grounded only in cases where one or a very few symptoms are taken as the basis of the prescription, while the remaining symptoms are ignored. Where this is done we often see deplorable mistakes committed. A remarkable instance of this is furnished by a celebrated surgical case. When Mr. Perceval was shot as he came out from the House of Commons, being mistaken for Sir Robert Peel, he came under the care of the celebrated surgeon, Mr. Guthrie. The wound was of the thoracic walls. The public interest in the case was very great. Daily bulletins were required and were issued. Mr. Guthrie reported that his patient's wound was doing well, and that his prospects of recovery were excellent. One day, after such a report, the patient died; and it was discovered at the autopsy that he died of empyema (or pus in the cavity of the pleura). How came Mr. Guthrie to blunder so terribly? It was explained in this way. His specialty being surgery, he had confined his attention to the wound and had overlooked the symptoms of pleuritis, which had, no doubt, been present for a number of days, obvious to whomsoever had eyes to see. To give this case as an instance of the impropriety of judging and prescribing according to the symptoms of a case, is to lose sight of the fact that

our law requires that the aggregate or totality of the symptoms be made the basis of the prescription. This is the all-important point."

In calmly and deliberately reviewing what are the requirements made upon him who would adopt this therapeutic law as his guide in the selection of remedial agents, it will at once be apparent to you, Mr. President and gentlemen, that he must be guilty of no slipshod work, and particularly is this the case with the veterinary practitioner. To obtain a true mental picture of the aggregate of the symptoms in the human being, with the advantages of subjective and objective phenomena clearly presented, is an almost Herculean task; and to arrive at the totality of the symptoms among domestic animals is a work of greater difficulty still; but I strenuously maintain, that no conscientious practitioner, be he human or veterinary, is justified in ignoring the responsibilities arising out of his profession because difficulties crop up in his path; nor do I believe that our own profession ever is daunted by difficulties, when once its members are convinced that a better course is open to them. For this reason, I am earnestly desirous of making my position as your essayist to-night as strong as possible, and hence I must ask your forbearance for a little longer in order to prove that my reasoning on this subject of the totality of symptoms is logical. But first let me clear the way of a few difficulties which some practitioners who are guided by this law, more ardent than wise, have caused to be brought against it. In speaking of therapeutics, it is absolutely essential to know what we mean by the term; simply this, "the science of treating diseased persons" (or animals) "by means of drugs." Now in the case of an animal that has sustained an injury—say broken knees in the horse, or a broken leg in the dog—the interference of operative surgery is called for; what do you rely upon, but your knowledge of anatomy and physiology, assisted by all that you have learned of surgery? so far, however, you have not prescribed any drugs, nor called to your assistance your knowledge of therapeutics. Few cases, however, occur where your surgical abilities may not be well supported by your knowledge as a therapeutist, and you will probably select a drug which is calculated to arrest the development of traumatic fever, act as a prophylactic against tetanus, and favour a safe and speedy healing of the wound. Again, in obstetrics, you may require to bring mechanical aids to assist the physiological process of parturition; such interference does not come within the scope of therapeutics; you may, however, counteract some abnormal conditions attendant upon parturition by the administration of drugs, such, namely, as would have a stimulating influence upon the exhausted muscular fibre of the uterus, and in this way combine in yourself the double office of operative surgeon and therapeutist.

In our professional capacity, we are very properly called upon to exercise our knowledge of sanitary science, in relation to drainage, ventilation, light, heat, wholesome food, etc., so as to modify or remove conditions unfavourable to health; in doing which we have to rely upon chemistry or mechanics, but these opportunities do not afford scope for the application of any law of cure. We have to act as sanitarians, not therapeutists, inasmuch as we do not combat disease by means of drugs. As I intimated before, many have brought this law of cure into sad disrepute by striving to apply it to their every action, and "to make it cover not only their treatment by drugs, but also the surgical, obstetrical, hygienic, chemical, and mechanical expedients and procedures (Dunham)."

Now, in order to apply this law of cure effectively, there are two series of phenomena with which you have to deal, viz., those of the sick, and those of the drug as they affect the healthy living body, and it is presumed that there is a definite relation between the two; and the great value of the law is that those who have mastered the study of those various phenomena are in a posi-

tion to say what remedy will be suitable for a given disease, even though they may never have had a case under their immediate notice, provided that they have the totality of the symptoms of the disease fairly laid before them. In proof of this assertion, I need only remind you that such experience was proved correct in the person of Dr. Hahnemann with reference to Cholera. Before he ever saw a case of Cholera, the whole of the symptoms, in the varying stages of the disease were reported to him, and he unerringly pointed out the remedies applicable to the various conditions, as was proved by the success which followed the treatment he prescribed. Having made an examination of your patient, and from your knowledge of anatomy and physiology, determined what organ, tissue, or function is in an abnormal condition, you seek to verify your conclusions by taking into consideration the total symptoms presented, viz., functions of respiration and circulation ; the condition of the tissues—say, of eye and ear ; the waste of same by means of the thermometer ; and the state of the excretions and secretions ; comparing these as you find them with what you know they should be, assisted by the sensations experienced in various parts of the body, and you obtain the sum of the phenomena presented, and are in a position to form a diagnosis ; but you must be careful not to overlook any obvious symptoms, nor to attach undue importance to some of those that may be most prominent, to the exclusion of attendant symptoms ; "practically the aggregate of the symptoms constitutes the disease under which the patient labours (Dunham)."

"What is called a disease in contradistinction to such an aggregate of symptoms is simply an abstraction, a mental conception devised for the purpose of expressing this aggregate in a single phrase. For example, the patient has heat of skin, a hard frequent pulse, rapid and short respiration, a quick, dry cough, or cough with rusty sputa. . . . . The patient, in addition, complains of oppression of the chest, of sharp pains through the lung on coughing, or of rawness behind the sternum. The physician by physical exploration of the chest, discovers, on percussing a certain part of the chest, dulness or a fine crepitation. Let this collection of symptoms constitute all there is about this patient which is a deviation from his condition when in health. These phenomena, being the results of positive observation, are known ; there can be no error or uncertainty about them. Now, if we wish to express to another . . . . the condition of our patient, it may be and is convenient to have a brief term, which will include and imply the presence of these phenomena. But does it add anything to our knowledge if we designate this aggregate of symptoms by the name Pneumonia or inflammation of the lungs ? The fallacy is that we are in danger of including under the given name cases agreeing in anatomical lesion but differing in symptoms, and requiring different treatment (Dunham)."

So far I have sought to show that the aggregate of symptoms as evinced in a sick person or animal constitutes the disease ; these phenomena, taken as a whole, form one side of the question which the professional attendant has to take into consideration. Now what is the other side to which he has to apply himself in order to restore the abnormal condition of his patient to a state of normality or health ? This is the therapeutic problem that has to be solved.

Until Dr. Hahnemann introduced to the world the fact that a therapeutic law really existed, only very vague ideas of such a possibility had ever been suggested, and the medical faculty depended on experiment and observation to determine what drugs were applicable to the alleviation or cure of disease. Such a procedure—for system it cannot be called—is extremely unreliable and unsatisfactory, and, as we have already seen, so it was felt to be in an eminent degree by such men as Dr. Sydenham and Dr. Paris. Dr. Hahnemann, however, and several other notable physicians formed the opinion that the only systematic method of determining the relation that exists between

the living organism and the properties of drugs could be satisfactorily cleared save and except by observation of the action of drugs upon the healthy subject. A gigantic series of experiments was performed by Dr. Hahnemann, and issued to the profession in the form of the "Materia Medica Pura." Now, if a healthy person takes a certain drug and experiences effects therefrom, he produces in himself an artificial disease; the phenomena which such a person finds developed in himself form the groundwork of the knowledge he can glean as to the action of this peculiar drug. It has been found by experiments without number that certain drugs are capable of producing in the healthy subject an aggregate of symptoms very, if not precisely, like those which are presented in specific diseases, and which we have been accustomed to designate under some special term based upon a pathological condition; and further, that under such circumstances the drug capable of producing such an aggregate of symptoms in the healthy is, when administered to one suffering from a disease as represented by a similar aggregate of symptoms, the one that will cure.

I have thus, in a very imperfect manner, attempted to lay before you the two series of phenomena upon which it is claimed a law of selection exists, viz., the symptoms of the patient and the symptoms produced by drugs upon the healthy, the same being expressed by the formula, "Similia similibus curantur."

Up to this point it has been my aim to answer the question which forms the subject of the present paper in the affirmative. I might have dilated, almost indefinitely, upon the study of symptoms, but time will not permit, and if it would I should be afraid of exhausting your patience; the subject is one that can only be fully appreciated after many hours' careful study and hard reading; but I may venture to assure you that it is a sufficiently interesting one to warrant my advising you to give it your earnest consideration.

I am quite ready to admit, and that from hard experience, that we, as veterinarians, labour under greater difficulties in applying this law than do practitioners of human medicine, inasmuch as it is extremely difficult, nay, well-nigh impossible, to get at what in the human subject are entitled objective symptoms, and without them of course you cannot obtain the all-important "aggregate"; but although not altogether satisfactory, there is, in most drugs, a very helpful indication that very often serves one in what otherwise would be a matter of great difficulty. I refer to the fact that most drugs present what is called a "leading symptom," such as the bright red, well-defined, smooth erysipelas of belladonna; or the rapid, full-bounding pulse of aconite. From indications such as these, many a path, otherwise rugged, is made plain.

It may be that I have altogether failed to impress your minds with the fact that there is really anything practical in this law, which I, among a regularly and constantly increasing number of medical practitioners, believe to exist in therapeutics. If so, I beg of you, gentlemen, to put it down to my incompetence to deal effectively and convincingly with the matter under consideration; but do not allow my inability to cast a shadow over the subject until you have searched for yourselves among the splendid literature that lies to your hands. I have made the assertion that, in my opinion, such a law exists in nature, and I believe I have proved it in practice; anyhow, the attempts I have made, when guided by this system, have been far more successful than those made under the prevailing practice of the so-called orthodox school. But I go further, and say that whereas, according to so high an authority as Dr. Paris, a former President of the Royal College of Physicians, there is really no guide, save that of experience, for the selection of a remedy, relied upon by orthodox practitioners, there should be, and to a large number of men in this and other countries there is that about this

system that enables one to say: In this we have a scientific basis to work on, a principle to guide in the practice of medicine. Therapeutics are really resolved into a science; there is no need for treatment to depend on haphazard guessing, inasmuch as we have a law to rely upon. But you may reply, You have made an assertion without proving it; in answer to which, I give you the assurance that to the unbiassed mind, the literature of the day abounds in proofs that even those who run may read, and withal be convinced. It has often been asked by those who make superficial inquiries only, What is the *modus operandi* of this law of cure? Various attempts have been made to explain this, but, to my mind, none of them are satisfactory, nor do I pretend to offer any opinion thereupon. I would ask you, gentlemen, Can any one of you explain why it is that chemical agents unite in definite proportions? This law of chemical affinity is absolute you know. I am sure I cannot, and you must pardon me if I add I don't believe any of you can explain why and how it is so. Chemists all admit it to be a fact, and they are satisfied to rely upon the law without stopping to ask why it is so; and I appeal to you, as practical men, why, on the same grounds, should any one refuse to adopt a law of therapeutics, simply because neither the discoverer nor any one else has solved the problem of its *modus operandi?*

Next to the two leading maxims which I have indicated to you as the basis of the law in therapeutics is the important fact that only a single remedy is used at one time; "every drug must be administered without the admixture of any other medicinal substance;" alternation of remedies is sometimes resorted to; some little may be said in its favour, but much more against it; alternation may be excused, but can never be defended as scientific; for my own part, although for lack of subjective symptoms, I have practised alternation in cases where danger was imminent, where immediate help was needed, I candidly confess that the difficulty of establishing a correct diagnosis accounted for the difficulty of at once hitting upon the right remedy; in other words, the fault was in myself, not the system; let the diagnosis be clear, and there is no reason why remedies should be alternated; "the alternate use of drugs is either a forced or self-indulgent palliation of a want of knowledge either of the drugs or of the diseases, or is even a matter of convenience."

(*To be continued.*)

GLASGOW VETERINARY COLLEGE.

A VERY successful summer session of this institution was brought to a close on the 12th July. The examinations, conducted by the Royal College of Veterinary Surgeons, commenced on the 14th July. The Board of Examiners included—Mr. George Fleming, LL.D., F.R.C.V.S.; Mr. J. Roalfe Cox, F.R.C.V.S.; Professor Duguid, F.R.C.V.S.; Professor Pritchard, M.R.C.V.S.; Mr. J. Vaughan, F.R.C.V.S.; and Mr. Finlay Dun, M.R.C.V.S., London; Mr. W. A. Taylor, F.R.C.V.S., Manchester; Mr. George A. Banham, F.R.C.V.S., Cambridge; Mr. W. B. Walters, F.R.C.V.S., Army Veterinary Department; Mr. Archibald Robinson, M.R.C.V.S., Greenock; and Mr. Richard Rutherford, M.R.C.V.S., Edinburgh. Principal M'Call, Professors Cooke, Limont, Macqueen and Renfrew, Glasgow Veterinary College, were also present.

Twenty-six students presented themselves for the "C," or final examination, and of this number the following were successful in obtaining the Diploma of the Royal College:—

Mr. Andrew Stewart, Paisley (Honours); Mr. James Hart, Dromara, County Down; Mr. Archibald Edgar, Port William, Wigtownshire; Mr. R. H. Gilmore, Ballymoney, County Antrim; Mr. Thomas L. Houston,

Greenock; Mr. Alexander W. Mackeand, Port William; Mr. William Macdonald Campbeltown; Mr. Samuel M'Conechy, Islay; Mr. Alexander Murdock, Drogheda, County Louth; Mr. William C. M. Smith, Forkhill, County Armagh; Mr. Finlay Kerr, Langside, Glasgow; Mr. Robert D. Dove, Dundrum, County Down; Mr. George O. M'Gregor, Bowling, Dumbartonshire; Mr. Robert T. Huston, Tynan, County Armagh; Mr. William Griffith Jones, Pwllheli, North Wales.

On the 22nd July three students were examined in Edinburgh for the "B," or second examination, and two passed, viz.:—

Mr. Hugh Farquhar, Kilmarnock; and Mr. Richard Hamilton, Ayr.

Twenty-eight students were examined on Saturday for the "A," or first examination, and twenty passed very creditably, viz.:

M. Joseph C. Thomson, Londonderry; Mr. Bruce D. Miller, Glasgow; Mr. Robert S. Thomson, Kirkwall, Orkney; Mr. Richard Marsh, Ballynahinch, County Down; Mr. James Dawson, Cotehill, County Cavan; Mr. Robert Clunas, Auldearn, Nairn; Mr. John C. Young, Glasgow; Mr. James Gibson, Biggar; Mr. John Brown, Lesmahagow; Mr. Robert Scott, Dumbarton; Mr. Robert Barron, Sutton, near Chester; Mr. Richard Birt Freeman, Dublin; Mr. John Caldwell, Stranraer; Mr. Benjamin Cook, Swansea, South Wales; Mr. Fred. George Warmington, Shrewley, Warwickshire; Mr. William H. Dalrymple, Stranraer; Mr. James M. Crawford, Ayr; Mr. John M'Clean, Kilcoo, County Down; Mr. John Y. Graham, Bridge of Allan: Mr. William M. Hutchinson, Markethill, County Armagh.

Medals granted by the Highland and Agricultural Society of Scotland, Mr. Robert Walker, of Leathamhill, and Principal M'Call, and certificates of merit by the college, were awarded in the different branches of study as follows:—

Horse Pathology (written examination).—Gold medal (Principal M'Call), Mr. Andrew Stewart; silver medal (H. and A. S. of S.), Mr. Alex. C. Forbes, Glasgow; first-class certificates, Messrs. Macdonald, Jones, Dove, Calderwood, and Kerr; second-class certificates, Messrs. Gilmore, Steel, M'Conechy, Deans, Mallock, and Huston.

Cattle Pathology (written examination).— Gold medal (Principal M'Call), Mr. Alexander C. Forbes; silver medal (H. and A. S. of S.), Mr. Andrew Stewart; first-class certificates, Messrs. Jones, Dove, M'Conechy, Gibson, and Macdonald; second-class certificates, Messrs. Hart, Kerr, Steel, Edgar, and Calderwood.

Practical examination of horses as to soundness, age, manipulation, etc.—Gold medal (Principal M'Call), Mr. Andrew Stewart.

Practical examination of cattle and sheep, as to age, operations, etc.—Gold medal (Mr. Robert Walker), Mr. Archibald Edgar.

Botany (written examination).—Silver medal (H. and A. S. of S.), Mr. James Dawson; first-class certificates, Messrs. Barron, Marsh, and Scott; 2nd class certificates, Messrs. Caldwell and M'Clean.

Chemistry (written examination).—Silver medal (H. and A. S. of S.), Mr. James Dawson; first-class certificates, Messrs. Barron, Scott, M'Clean, and Marsh; second-class certificates, Messrs. Caldwell, Clunas, and Hutchinson.

Materia Medica (written examination).—Silver medal (H. and A. S. of S.), Mr. Robert Scott; first-class certificates, Messrs. Barron, Dawson, Caldwell, and Gibson; second-class certificates, Messrs. M'Clean, Clunas, Marsh, and Gavin Miller.

Best oral examination on Botany, Chemistry, and Materia Medica.—Gold medal (Principal M'Call), Mr. Robert Barron.

Mr. Campbell's, Kirkcudbright, prize for the best essay on "Tuberculosis."—Mr. Robert D. Dove.

Prescription writing.—Mr. W. H. Dalrymple.

At the close of the junior examination, Mr. Finlay Dun intimated that Messrs. Warmington, Dawson, M'Clean, Scott, Marsh, and Freeman had passed with "great credit," and Mr. Robert Barron, with "very great credit."

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

AT meetings of the Scottish Section of the Board of Examiners, held in Glasgow and Edinburgh on and between the 14th and 26th of July, the following gentlemen passed their "Final Examination," and were admitted members of the profession.

Glasgow Veterinary College.

Mr.	Samuel McConechy	Islay, Argyleshire.
„	George O. McGregor	Bowling, Dumbartonshire.
„	Finlay Kerr	Langside, Renfrewshire.
„	William Macdonald	Campbeltown, Argyleshire.
„	Alex. William Mackeand	Port William, Wigtownshire.
„	Thomas L. Houston	Greenock.
„	Alexander Murdock	Drogheda, Co. Louth.
„	Robert Duncan Dove	Dandrum, Co. Down.
„	James Hart	Dromara, Co. Down.
„	Archibald Edgar	Port William, Wigtownshire.
„	William C. M. Smith	Forkhill, Co. Armagh.
„	Richard H. Gilmour	Ballymoney, Co. Antrim.
„	Andrew Stewart*	Paisley.
„	William G. Jones	Pwllheli, N. Wales.
„	Robert Tod Huston	Tynan, Co. Armagh.

Dick Veterinary College, Edinburgh.

Mr.	Harry Gelsthorpe	Annesley, Notts.
„	Henry Barrett	Hereford.
„	Alexander Wood	Insch, Aberdeenshire.
„	Charles Ladds	Paxton, Huntingdon.
„	Robert O. F. Stewart	Alford, Aberdeenshire.
„	Robert C. Irving	Auldgirth, Dumfriesshire.
„	Alfred Kershaw	Southport, Lancashire.
„	John Nicholson	Hetton-le-Hole, Durham.
„	John Riddock	Todlaw, Banffshire.

New Veterinary College.

Mr.	T. D. Davies	Bootle, Lancashire.
„	Thomas A. Rudkin	Grantham, Lincolnshire.
„	J. Richardson	Moffat, Dumfriesshire.
„	J. J. Ridley	Bellerby, Yorkshire.
„	E. H. Hallam	Sheffield.
„	Thomas O'Malley	Ennis, Co. Clare.
„	Daniel Lyons	Ballytigue, Limerick.
„	John F. Dixon	Warrington.

The following passed their "Second Examination" :—

Dick Veterinary College.

Mr. A. E. Paley.
„ F. A. Ball.
„ H. Taylor.
Mr. D. Graham.
„ A. Davidson.

New Veterinary College.

Mr. A. Watson.*
„ F. Sweeting.
Mr. R. Hollings.

Glasgow Veterinary College.

Mr. Richard Hamilton. Mr. Hugh Farquhar.

The following passed their "First Examination":—

Dick Veterinary College.

Mr. J. Best.	Mr. G. Howie.
„ A. Cleasby.	„ J. F. Roden.
„ E. Watson.*	„ C. McGregor.
„ T. Drinkwater.	„ J. R. Moir.
„ J. Keane.*	„ A. Marshall.
„ J. Carruthers.*	„ D. O'Regan.
„ W. Weighell.	„ J. Kelly.
„ J. Loughtin.	„ D. Cameron.

New Veterinary College.

Mr. P. Pike.	Mr. A. Neish.
„ J. Aitken.	„ Cleary.*
„ J. Ogden.	„ W. Gibson.†
„ W. Hall.	„ Geo. Howe.
„ H. Clarke.	„ P. Young.
„ J. Buxton.†	„ F. Armstrong.
„ F. Wormald.	„ J. Urmson.
„ W. J. Fletcher.	„ H. Newsome.
„ J. Caldecott.	„ J. Bradley.*
„ A. Watson.†	„ J. R. Charlton.†
„ P. Bell.	„ W. M. Peffer.

Glasgow Veterinary College.

Mr. W. M. Hutchinson.	Mr. J. C. Thompson.
„ B. D. Miller.	„ R. S. Thomson.
„ J. C. Young.	„ R. Scott.*
„ J. Y. Graham.	„ W. H. Dalrymple.
„ J. M. Crawford.	„ J. McClear.*
„ J. Brown.	„ B. Cook.
„ F. G. Warmington.*	„ R. Clunas.
„ J. Caldwell.	„ R. Marsh.*
„ J. Gibson.	„ R. B. Freeman.*
„ R. Barrow.†	„ J. Dawson.*

* Passed with Great Credit.

† Passed with Very Great Credit.

R. RUTHERFORD, M.R.C.V.S.,
Secretary Scottish Section of the Board of Examiners.

Army Veterinary Department.

Gazette, July 29th.

Veterinary Surgeon on probation J. Finlayson, to be Veterinary Surgeon (January 12th); Charles Edwin Nuthall, gent., to be Veterinary Surgeon on probation.

The Indian Government has consented to increase the veterinary establishment of that country by the appointment of eight probationary veterinary surgeons to the Army Veterinary Department. This resolution, due to the urgent representation of the Principal Veterinary Surgeon, makes a total of thirteen increase in the Indian Veterinary establishment within a year. The competitive examination to fill these appointments took place in the early part of August.

Obituary.

THE death is announced of Friederich Unterberger, Councillor of State of the Russian Empire, dignitary of several high orders, and professor and director of the Dorpat Veterinary Institute, at the age of eighty-four. Born at Riga, he studied at the veterinary schools of Vienna, Berlin, Munich, and Stuttgart, and was located for some time at various studs in Germany and Hungary. In the Government of Simbirsk, he was Epizootic Veterinary Surgeon for several years, and in 1849 he was made a professor in the Dorpat Institute, of which he was made director in 1858. In 1882 he retired from the active duties of this office, and succumbed on June 8th. He was the author of a number of works on hippology and veterinary medicine, and particularly distinguished himself by his studies of Rinderpest. By his management and teaching he raised the reputation of the Dorpat school to a very high level. Unterberger was an Honorary Associate of the Royal College of Veterinary Surgeons.

Notes and News.

LITERATURE.—In the volume of the "Encyclopædia Britannica" just issued, the articles "Mule" and "Murrain" are from the pen of Dr. Fleming, Principal Veterinary Surgeon to the Army, who has also been engaged to contribute the articles on "Rabies" and "Veterinary Medicine and Surgery" in forthcoming volumes. His Royal Highness the Duke of Cambridge has accepted the dedication of Dr. Fleming's work on "Operative Veterinary Surgery."

HORSE AND ASS FLESH IN PARIS.—During the past year, 12,276 horses, 52 mules, and 406 donkeys were killed for food in Paris, the net weight of the horses and mules, after they have been got ready for cutting up, being 190 kilogrammes (420 lbs.) each; and of the donkeys, 50 kilogrammes (110 lbs.), and thus the total amount of food supplied by these animals was about 5,000,000 lbs. A third of it was sold in the form of joints at the average carcase rates of tenpence a pound for the fillets; sevenpence a pound for the best, and fivepence a pound for the second-best joints. It is added incidentally—not to say, significantly—that only a third of this meat was sold in joints, the rest being made up into sausages.

TEXAS CATTLE FEVER.—It appears that Texas Fever has been imported into Chicago by Texas herds arriving by railway in that city, and *The Times* correspondent, in alluding to the malady, refers to the report of the Agricultural Department of the United States regarding it. It is stated in *The Times* telegraphic news that the disease is not contagious; but, on the other hand, an account is given in the report of an outbreak of Texas Fever not very long ago in a prairie in Missouri, in which 200 head of Texas cattle had just been placed. An epidemic of this special fever immediately arose, and every animal that came in contact with these cattle, or walked over the ground where they had been, died, the Texas animals being so full of ticks that they literally dropped from them. The owner of the Texas herd, finding what mischief had been wrought, placed the animals in enclosed pastures, where they remained for some time. After their departure, and a hard frost having intervened, a number of fattening cattle were brought to the same pastures, and of these fifty-seven immediately sickened and died. From recent experiments, undertaken by Dr. Salmon, it seems that living animals may easily be brought into a condition to completely resist the effects which usually follow exposure to the virus, and, indeed, may be made perfectly safe, though surrounded on every side by the germs of this fatal disease. These experiments have conclusively demonstrated that sound cattle may be

successfully inoculated by using material obtained from the spleen of sick cattle. A peculiar micrococcus has been found in this material, and cultivated outside the body, though under such circumstances it loses its virulence. Recent experience has shown that the Texas Fever is neither so local nor so amenable to temperature as was usually believed. It was a cardinal maxim that the contagion was destroyed by frost, and could not survive the winter in districts where freezing weather prevailed; but it is now known that in many infected districts frost has not the slightest power of checking it, and what is still more alarming, that as the contagion marches northward the power of resistance to cold is proportionately increased. As to localization, it was generally supposed that the only cattle capable of infecting northern pastures were those from the neighbourhood of the South Atlantic and Gulf coasts, or from South Carolina to Texas; but the border line has now been crossed, and the disease is steadily progressing, at the rate of from one to four miles per annum, now including all North Carolina east of the Blue Ridge, and crossing the James River in Virginia, in which State enormous losses of cattle have taken place.

PROTECTIVE INOCULATION.—The French Chamber of Deputies have voted the sum of £3,200 to secure for M. Pasteur a part of the domain of Villeneuve-l'Etang, whereon to pursue his studies in the contagious diseases of animals. The laboratories heretofore set apart for the purpose have become quite inadequate, as may be inferred from the fact that in April alone M. Pasteur sent out 200,000 doses of vaccine for cattle. The buildings at Villeneuve occupy nearly four acres.

The experiments in the inoculation of sheep at Montpellier Agricultural School have proved that the effect is undiminished after the lapse of over two years. The thirty-six sheep vaccinated in May, 1882, resisted the action of the virus in three special inoculations, namely, in May, 1883, October, 1883, and May, 1884, and are flourishing at the present time.

CATTLE PLAGUE IN SOUTHERN RUSSIA.—In a recent advice from Odessa, a correspondent of the *Daily News* stated that Cattle Plague (Rinderpest) was spreading unchecked in the Government of Samara. In order effectively to arrest its ravages, a commission was recently despatched to Nicolaievsk, consisting of a veterinary officer, police officers, and servants—the latter as slaughterers. The peasantry showed much curiosity in the proceedings, and assembled in large numbers at the place appointed by the commission near the town. Here large trenches were excavated for the reception of the carcases of the infected and slaughtered animals. By the veterinary officer's command, the cattle of the neighbourhood were driven into an extensive enclosure. So far the various herdsmen and owners showed no inclination to interfere. The examination of the cattle proceeded, and already three animals had been condemned, slaughtered, and their carcases cast into the pits, when an extraordinary crowd of frenzied peasant women advanced from the town. Behind the women came the men, armed with fireirons, bludgeons, flails, spades, etc. The officer endeavoured to explain the absolute necessity of his action, but all to no purpose. From high words they came to blows. The officer found himself compelled to retreat. The police and servants followed, and not too soon for their own safety. Two young farmers in red shirts, powerfully built, well-mounted, and armed with iron bludgeons, rode hastily up in search of the unfortunate commission, which was now happily beyond the reach of the multitude. They accused the commission of slaughtering healthy animals, whilst they received only three roubles per head compensation.

DOCKED HORSES.—A Horse Guards' order has been recently issued, forbidding the purchase of "docked" horses for the army, as the mutilation renders them less useful.

Correspondence.

HOW ARE COUNTRY VETERINARY SURGEONS TO GET A LIVING?

SIR,—I see in the *Wilts and Gloucestershire Standard and Cirencester and Swindon Express* an article headed, "The Farmer's Medicine Chest," being a list of remedies for the domestic veterinary treatment of farm stock, arranged in alphabetical order, with the doses for different animals, by Professor Brown, from the Journal of the Royal Agricultural Society.

Some Professors are quite willing to get as much pecuniary profit as they can out of students while they are at college ; then, when they have obtained their diploma, endeavour to take the bread out of their mouths. A country vet. can only charge 6d., or 1s. at the most, per mile for his journey, and little or nothing for advice ; so, if the farmer or client is to supply his own medicines, how are we to live? I wish Professor Brown had to try it ; then, perhaps, he would not be quite so fast in writing such articles as the above.—I am, sir, faithfully yours, A COUNTRY VET.

THE MEETING OF THE NATIONAL VETERINARY ASSOCIATION.

SIR,—At the late meeting of the National Veterinary Association, at Manchester, some rather severe strictures were passed on the medical profession for its encroachments on the province of veterinary surgeons. It is much to be hoped that cause of complaint may cease, because it is for many reasons most desirable that cordial relations should, as far as possible, exist between the two professions, and it may not here be out of place to look how they at present stand towards each other.

Not long ago, our Boards of Examiners became constituted almost entirely of veterinary surgeons, a wise measure, because we were, before this reform, justly exposed to all kinds of remarks when it appeared as if we were unable to examine our own students. The result of our taking this duty upon ourselves is a great improvement in the quality and efficiency of the examinations, because veterinary examiners best know what is required of veterinary surgeons. Most of us now think that the veterinary profession no longer wants leading-strings, yet it should never forget that it owes its best thanks to the medical profession for its assistance in the past, during its struggling infancy.

Much dissatisfaction has been created by certain injudicious members of the medical profession who write to the newspapers on the diseases of horses and cattle. These gentlemen frequently show that they have only a superficial acquaintance with their subject, and they almost to a man appear to go for their information to our most antiquated books, and to still cling to the old and exploded theories of contagion and infection. The consequence is that their letters are only too often misleading, and, strange to say, many of them appear to seek opportunity to rail at veterinary surgeons. Now, too much attention should not be paid to utterances made by those who are often only seekers after notoriety, but at the same time their assertions, when erroneous, should be contradicted.

As an illustration of the loose writing of some of these "veterinary doctors," as they have been called, we may give a brief history of the part played by them during the great Cattle Plague of 1865. In spite of the warnings of Professors Simonds and Gamgee, Dr. George Fleming, and many other veterinarians, that the disease was of foreign origin, and only spread by infection and contagion, a great many medical men, some of eminence, maintained the contrary, and the result was confusion and a disastrous policy. At last the opinion of the veterinary profession prevailed, and it issued from the

contest triumphant; yet, in the face of these facts, so recent, we still find some medical writers who know so little of the history and literature of the subject as to maintain the contrary of what we have just stated.

The great majority of the medical profession is most favourably disposed towards us. We may truly say that medicine is yet in its infancy, or, at most, that it is only now *on the threshold of pathological knowledge.* Let us for a moment glance at the list of appalling diseases not yet properly determined, and we shall see how necessary it is that the medical profession should in its studies receive help from every possible quarter. Consider such maladies as Cholera, Cancer, Phthisis, Syphilis, Typhus and Typhoid Fever, Diphtheria, Scarlatina, Yellow Fever, Tetanus, Hydrophobia, and many other fearful scourges of the human race, and we see how much has yet to be discovered, and how much necessity there is for the study of comparative pathology, in which veterinary science may well hope to play one of the most important parts.

The two professions can be of immense benefit to each other; let us then at all times try to remove friction, and endeavour to establish and maintain cordial relations between them.—Your obedient servant,

London, *August 15th*, 1884. JAMES LAMBERT, F.R.C.V.S.

THE DEGENERATION OF THE PROFESSION.

SIR,—I am not in a position to give Mr. Davison reasons for the rejection of so many students by the examiners of the Royal College of Veterinary Surgeons, but if want of attention in educating and training them in the teaching schools will produce such a result, then the degeneracy can be accounted for. If your correspondent will ascertain how much clinical instruction and how many lectures the Principals of the schools give the senior students during the last twelve months, I fancy the information would be rather startling for at least one school, and though some teachers pretend to be the students' friends, it would show that the friendship does not extend much, I fear, beyond the limit of fees. Some of us have great reason to complain of the way we are treated. We see little, if anything, of practice, perform no operations and rarely witness them performed, and never get a chance even of administering a dose of medicine. As for cattle, dogs, sheep, or pigs—well, I won't mention them. We students want less talk about us, and more teaching in our classes. If we are not taught we cannot know; teachers should have higher aims and notions of duty and responsibility than the mere obtainment of students' fees.—Yours, etc.,

August 12th. "AN UNFORTUNATE STUDENT."

DEAR SIR,—It seems strange how a man can write such remarks as those of Mr. Davison about the veterinary profession degenerating.

Fruit first becomes ripe, and then, in some cases, it decomposes. Our profession is not by any means mature, and surely it is necessary for it first to arrive at that condition ere it degenerates.

Men must by nature be calculated for the surgical and medical treatment of animals. It is not possible to *make* a horseman—a man must be *born a horseman.* There are some who have made a mistake in choosing their "line" in life, and they may be those who fancy the profession degenerates.

Every year will find our profession taking a grander stand, scientifically and socially, at home and abroad. "EXCELSIOR."

"THE VETERINARY SURGEONS ACT."

DEAR SIR,—Providing the privileges this Act confers upon us as veterinary surgeons were realised, I should look upon it with favour;

although I consider it is injurious to some veterinary surgeons at the present time, but the benefit likely to be derived from it in the future, ought to counteract any little annoyance experienced at present. There is one thing respecting it I cannot understand, that is, why the men who are not registered quacks should still be allowed to practise as veterinary surgeons, and in some cases represent themselves to be qualified. Men of this class are plentiful, especially in country districts; they are an unprincipled lot, as a rule, and are always glad to rob a qualified man of a case, or even of his good name. The sooner this class becomes extinct the better for the profession generally. There is quite sufficient competition amongst qualified men, without being annoyed by quacks. My opinion is that in England we are overrun by veterinary surgeons, and if they multiply during the next ten years as they have done during the same number of years past, there won't be a living for all of them in this country. I consider the veterinary surgeons of thirty years ago, taking them throughout, were better pecuniarily than the veterinary surgeons of the present day. I look upon overstocking as being most injurious to the profession, both socially and pecuniarily. Veterinary surgeons must live, and to do so now necessitates a good deal of humiliation and probably favour.—Yours faithfully, "VERAX."

TO CORRESPONDENTS.

AMATEUR V.S.—1. There is perhaps no safer or better purgative for cattle than Epsom salts. 2. It is difficult, in a brief space, to answer your second question. You will find the rules which should guide you in any work on surgery—human or veterinary.

SCRUTATOR.—We shall try to find room for it in our next.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from T. Challwin, Adelaide, South Australia; Professor McCall, Glasgow; R. W. Burke, A.V.D., Cawnpore; J. E. Sutton, London; "A Country Vet."; "M.R.C.V.S."; "Rejected Student"; J. D. Overed, Blofield; R. Rutherford, Edinburgh; R. H. Dyer, Limerick; "Verax"; T. H. Lewis, Crewe; H. Kidd, Hungerford; "Excelsior"; "Amateur V.S."; "Unfortunate Student"; M. Graux, Amiens; J. Lambert, A.V.D., Woolwich.

BOOKS AND PAMPHLETS: *A. W. H. Wirtz*, Elfde Jaarverslag van het Parc Vaccinogène bij's Rijks Veeartsenijschool te Utrecht (1883); *D. Putz*, Ueber Hufkrebs und Strahlfäule; *F. Rom. Tobolewski*, Kurze Uebersicht ueber Ban, Zweck und Krankheiten der Haare; *H. Bouley*, La Nature Vivante de la Contagion; *D. Hutcheon*, Reports of the Cape of Good Hope Colonial Veterinary Surgeon for 1882, 1883; *W. Ellenberger*, Lehrbuch der Allgemeinen Therapie der Haussaugthiere; Esposizione della R. Scuola Superiore di Medicina Veterinaria di Milano.

JOURNALS, ETC.: *Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Repertorium der Thierheilkunde; Clinica Veterinaria; Quarterly Journal of Veterinary Science in India; Repertorium der Thierheilkunde; Recueil de Médecine Vétérinaire; Der Thierarzt; Wochenschrift für Thierheilkunde und Viehzucht; Annales de Médecine Vétérinaire; Lancet; British Medical Journal; National Live Stock Journal; Medical Press and Circular; Journal de Médecine Vétérinaire; Archives Vétérinaire; Revue Vétérinaire; Live Stock Journal; Edinburgh Medical Journal; Journal of Comparative Medicine and Surgery; American Veterinary Review; Il Medico Veterinaria; Der Hufschmied; L'Echo Vétérinaire; La Presse Vétérinaire; Mark Lane Express; Field.*

NEWSPAPERS: *Edinburgh Courant; Scotsman; Glasgow Herald; Manchester Examiner; Manchester Guardian; Irish Times.*

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

OCTOBER, 1884.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 156.)

THIS discharge from the nostril is the most insidious, and at the same time most dangerous form of the complaint, and one which requires our best services. I have often failed to detect any alteration of the submaxillary glands in these affections. It is said that Nasal Gleet is communicable by means of inoculation, the glands assuming that particular appearance met with in Glanders. In the case referred to by me I could not say there was any change discernible in the glands of the pony; the only symptom present was the *altered colour* and appearance of the Schneiderian membrane. I have often observed this membrane to assume a striated aspect, which has induced me to look closely for other symptoms; and such was the case in this instance. A qualified practitioner of veterinary medicine, who examined the pony referred to, was actually aware of the experiment and its results upon the ass, yet gave a certificate to the effect that the animal was *sound* and *free from disease*, and especially was he free from Glanders. I cannot understand how any man can do such extraordinary things as these if he has a reputation at stake. I can only account for it in one way—viz., such a person as I have alluded to never *reflects*, never gives himself any trouble concerning the profession he is a member of.

With this experience before us, we cannot exercise too much caution in endeavouring to ascertain every particular and all the symptoms relating to diseases of the membrane of the nose. It has been said the Schneiderian membrane is very thick; that it lines the cavities of the fossæ; that its colour is of a pinkish hue; that it is influenced greatly by atmospheric air, and, it may be added, by the gases found in the stable; also, that it secretes mucus, etc. This all reads well. How often are we told that this membrane assumes a perfectly healthy appearance, when in fact it is not healthy? Often it is anything but of a *pink* colour. We are all aware of the susceptibility of the horse to catarrhal affections, and it is not unreasonable to suppose that not only a change of colour, but of its substance also, might, and does occur after repeated attacks of a cold. If we reflect for a moment upon the vast extent of mucous membrane lining the air-passages, we need not be surprised at horses becoming whistlers, wheezers, pipers, high blowers, bulls, grunters, roarers, etc. The only wonder is that they escape so often. Nasal Gleet sometimes terminates in Glanders. Has any veterinary surgeon, when *first* called to treat a case of Nasal Gleet, inoculated an animal with the nasal discharge for the purpose of testing its innocuousness? I have never heard of its being done. In that case to which reference was made I succeeded in producing Glanders. That was a great fact. Who can assert that many cases of Gleet, in some particular stage, are not capable of propagating this disease? I am inclined to the opinion that a lesser number of cases of Glanders would be met with if we would sacrifice an animal, of little money value, occasionally; at all events human life would be spared more frequently than it is. A case was recorded of a boy some time since having died of this loathsome complaint; how or in what manner the disease was contracted was not satisfactorily proved. That the boy had something to do with a horse suffering from Glanders there was not the shadow of a doubt; at the same time, evidence was wanting to fix the *receiving* of contagious matter *from* the *animal in question.* Still, no person can come to any other conclusion than that of the lad having been poisoned with the matter of Glanders. I am, therefore, of opinion that an animal

at the time it is presented for examination, having a nasal discharge, with an approach to an unhealthy state of the mucous membrane, should be *rejected*.

(*To be continued.*)

CASES IN PRACTICE.

BY W. L. WILLIAMS, V.S., MONTREAL, CANADA.

Impotence in a Stallion.

EARLY this summer I was asked to see a valuable imported Norman stallion, which, the owner said, could not serve mares. The horse was an exceptionally large and well-developed animal, to all appearances perfectly sound.

A large, roomy mare, in "season," being at hand, afforded a good chance for observation. The horse, although quite amative, was not unusually so, but as eager as could be desired, erection of penis prompt and normal.

He repeatedly mounted the mare in good style, and after some excitement, would enter the vagina to a distance of perhaps four to six inches, when he would abruptly withdraw his penis as though from some sudden pain, and after making five or six such attempts, would dismount.

Repeated mounts resulted invariably in the same manner, no semen escaping in any case so far as could be observed. The previous history of the case is not at command, he having been imported less than a year ago, and never having served a mare here, nor tried until last spring, when, after repeated trials, he was returned to the importers, where I examined him. His penis is of medium size, and perfectly natural as far as can be seen. The testicles are well formed, good size, and normal consistence.

An ordinary catheter passed readily into his bladder, and with catheter *in situ* rectal exploration revealed nothing abnormal, except that, in my experience, as a rule, semen can readily be passed from the vesiculæ seminales out through the catheter when partly withdrawn, whilst in his case none could be obtained.

There was no enlargement of the prostate, and both vesiculæ seminales appeared small and empty.

Can some reader of the Journal inform me what I have to deal with, and how to treat it? It could not be an obstruction in the urethra, or the catheter could not be so readily introduced, nor could it well be an obstruction in the outlet of the vesiculæ into the urethra, or they would be distended with semen.

The horse's movements are apparently perfect, so it is scarcely possible to understand how it could depend upon any spinal lesions; and further, he appears to have no difficulty in assuming the necessary position for successful coitus, so long as the penis does not enter the vagina.

Dystokia.

During April last was called to attend a medium-sized, aged mare, in foal to an imported draught stallion. She had been in labour twenty-four hours, and had been manipulated by several neighbours, who were only successful in badly irritating the genital passages, and making the mare so restless and vicious, that upon my attempting to make an exploration she at once began shifting about and kicking, and in spite of twitch and side-lines, could do nothing with her until she was cast and securely tied.

The foal, large and fully developed, lay in the anterior vertebro-sacral position, slightly deviated to the left, the anterior limbs protruding from the vagina, soles downwards. Traction on the feet readily brought the shoulders near enough to admit of imperfect exploration, but the neck could not be reached except for a very short distance, where it disappeared inferiorly beneath the well-dilated os uteri. The head could be plainly felt under the floor of the vagina, the nose against the brim of the pelvis, showing very plainly exteriorly, just above the mammæ. Repulsion could not be effected, neither could the head be dislodged by external nor internal manipulation, and as the mare was not very valuable, was thoroughly exhausted, and rupture of the uterus being suspected, the owner was advised to destroy the mare, but he dissented, and asked that the fœtus should be extracted.

The left fore-leg was pulled away after splitting the skin, two

or three of the exposed ribs removed, making an opening of sufficient size through which all the internal viscera were removed. The ribs were then all cut on each side, when slight traction on the remaining fore-leg brought the fœtus away, with the head and neck deviated to the side.

Upon examination the uterus proved to be intact, and that the head of the fœtus had in some way caught the lower part of the uterus near the os, and pushed it along, infundibulum like, underneath the vagina, where it could be readily felt through the vagina and displaced uterine wall, and constituted a serious obstruction to parturition. The mare lived two or three days afterwards.

During the present summer I was called to attend a high-grade Shorthorn cow, in labour several days. The fœtus was quite putrid, and slight traction on any available part caused it to tear away. Two hind-legs were removed, and more legs were felt, but the decomposition was so great that it could not be determined by exploration what the parts were, nor in what position the fœtus lay.

Previous to my arrival the attendant noticed a tough membrane protruding from the vagina, which he was satisfied could be nothing but the "mater bag," and punctured it with a knife, but when he looked into it found the inside lined with abundant long hair, and the membrane as thick and tough as calf-skin. Examination showed clearly that the peculiar membrane was, indeed, the amnion, and so far as I could reach it was lined thickly with hair.

The cow being in a hopelessly exhausted condition, I advised the owner to destroy her, and hurried off to the train to return—not, however, until I had asked the owner, who was quite an intelligent farmer, to make an autopsy and report the result. The fœtus proved to be a monstrosity with four hind-legs, and the amnion throughout was densely covered with hair as long, if not longer, than that on the fœtus.

I wish at a later period, when I can procure drawings, to describe a very peculiar case of maternal Dystokia in a mare, due to fractured pelvis.

The pelvis, which is in my possession, is quite a curiosity.

"BURSATTI": RECORD OF CASES DURING 1883.

BY RICHARD WM. BURKE, M.R.C.V.S., A.V.D., INDIA.

(Continued from page 163.)

Discrimination must, moreover, be made in the growth of adventitious fungi from the growth of those specific. Dr. Beale* writes: "Whenever animal or vegetable matter is undergoing disintegration and decay, low organisms, it is true, grow and multiply; but *the true cause of the pathological change may have been in operation long before the growth and multiplication of the fungi commenced.*"

Dr. Mitchell says: "Vegetable parasites (the fungi, etc.) are found almost universally on the surfaces, as seen in some of the cutaneous diseases, and may then destroy the structures on which they have fixed."†

Dr. Hardcliffe Crocker,‡ physician to the Skin Department of the hospital, University College, London, says: "Local treatment alone will remove them in a few weeks." Can this be said of Bursatti?

"One of the most common characteristics of fungi is their brief duration—they are doomed to almost immediate destruction."—M. Figuier.

Contagious diseases are characterised by fever; Bursatti is during no stage attended with fever.

There is, *inter alia*, another argument against this *fungus* theory which is still more significant. Surely, if "Bursatti" were due to the action of a vegetable fungus, the disease would be transmitted by contagion most readily. And yet what are the facts? That every native *salootrie* in India handles wounds free from it immediately after he has been touching Bursatti sores, and without any preparation, and this with the most perfect impunity. It may be fair, I think, to state that Veterinary Surgeon Spooner Hart, from his practical connection with horses and their diseases in general in India, which has extended over many years, is entitled to write with some authority; and an analysis of his writings in the *Veterinarian* clearly depre-

* Lionel S. Beale "On the Microscope."
† "Treatise on Cancer." By Dr. R. Mitchell, 1879, p. 5.
‡ "Clinical Lectures on Dermatophytic Diseases," 1881.

cates any notion with regard to the adoption of the parasitic theory of this disease as of doubtful significance, and untenable alike in practice and in theory. His opinions claim serious consideration. He says*: "It has been the custom with Indian veterinary surgeons and the public to treat Bursatti as an infectious and contagious malady, and it is very wonderful how some erroneous inferences and doctrines have originated, and are handed down from time to time, and are accepted. This promulgation of incorrect views does infinite harm, for it has the effect of veiling ignorance, and acts as a barrier to research. Practice, to a great extent, is guided by theory, and therefore it is necessary that true theories should be promulgated. In a practical point of view it is most important to know whether a disease is or is not infectious and contagious, hence I was determined to find out the truth of the statement. Practice and time have afforded ample proof of the non-infectiousness of Bursatti, for my bursatied subjects stand among other animals, and I have never seen any ill effects ensue. I have several times been requested by owners to remove Bursatti cases from the adjoining stall or box; and, really, the contagion theory has existed so long that one experiences great difficulty in satisfying or correcting a believer in the theory. To assure myself on the contagious or non-contagious nature of Bursatti, I took,—

"1. Exudative matter from the surface of Bursatti ulcer, and inserted it under the skin of the same subject from which it was taken. The part became scabbed, and was healed in a few days.

"2. Bursatti matter from one subject, and implanted it under the skin of another bursatied subject, and found that nothing resulted from it.

"3. Exudative matter from an old bursatied subject, and inserted it under the skin of a horse not the subject of Bursatti. This experiment, like the two preceding, threw no light on the matter.

"4. I also had recourse to administering internally Bursatti exudative matter to other subjects, and have likewise

* *Veterinarian*, 1873, p. 386.

drenched them with the blood of bursatied subjects, but without effect.

"*Having repeated these experiments several times, and in each instance with negative results, I infer that the disease cannot be communicated from one subject to another by inoculation, and, therefore, is non-contagious.*"

Mr. John Burke, assistant-professor, Government Veterinary School, Lahore, informs me that—"The 'contagion theory' of Bursatti was exploded some thirty years since by experimental inoculation, and, with the exception of Colonel Apperly, officer late in charge of Poosah stud, I do not believe there are any veterinary surgeons who would now regard the disease as contagious or infectious." And my own inoculation experiments would confirm the above; for both the experiments conducted by other veterinarians before me, and those subsequently done by myself also, during last year, in the way of direct inoculation, have alike failed to establish any connection between this and truly specific affections. Briefly, the disease is not transmissible.

Before the system of morbid pathology—the study of the physical bases of disease—was developed, we veterinarians, as well as the medical faculty generally, were accustomed to test disease by its visible symptoms. Since its development, however, we are come to regard its pathological effects in the determination of the nature of disease rather than as we have heretofore done. Studying the pathological effects of this disease *post-mortem*, therefore, we have proved as conclusively as possible that it is analogous to human Cancer; that is, it produces certain changes in the internal organs of the horse that are inseparable from certain changes in similar conditions with human beings (*vide* VETERINARY JOURNAL *et Veterinarian*, 1882). So far as a knowledge of its pathological anatomy goes, I think I may fairly claim to have been almost the first to have attempted to describe it. One of our latest writers on the subject says*: "Visceral lesions have not been observed by me."

Clinically, it is now my duty to try to illustrate by actual

* "Papers on Bursatti." By F. Smith. VETERINARY JOURNAL, vol. ix., p. 304; 1879.

records what I have before merely preached through odd contributions to the two English periodicals.

I believe that any adequate appreciation of the nature of disease can only come about as a consequence of collective consideration. The prophets of a one-sided study of disease appear to have forgotten entirely the dicta of our predecessors, that all such study and investigations lead to discoveries only to be described concisely in the Latin tongue as *montes et maria!* Unless a more comprehensive and all-embracing view is taken, there is every probability that the true pathology of this disease will be engulfed, and then will certainly devolve on us a re-construction, which will strain the relations of all existing records, and which will be little short of a confusion. The contributions on the subject of the past twenty years have been both important and intelligible; and what is remaining to be done is simple extension of that knowledge by added contributions from different members upon the varied points now touched.

Histology.—The conclusions from the microscopic investigations of Professor Kettlewell, of the Lahore Veterinary School, formerly of the Stud Department, as well as our own, and the concurrence since given by others who have had opportunities of examining specimens prepared by ourselves, we have heard forcibly disputed in these columns by one or two contributors, who have maintained that we cannot make valid our point, and that our "theory" will not stand the test of competent scrutiny. But I must dissent from the authority of our opponents so far as to say that this challenge has been now reversed, as specimens for examination prepared by them, on being delegated to undoubted authority, refused to show any trace of the mistaken parasites. To judge alone by the multitude of guesses that have been from the first hazarded respecting the parasitic theory of the disease, this phase of its pathology would appear to be now well threshed out. Be it remembered that one of its first supporters, Mr. F. F. Collins, late Principal Veterinary Surgeon in India, gave it as his opinion that the disease was "probably parasitic," without ever having placed a section under the microscope; so he believed that the disease was spread "through the use of water," and if it were only regimental horses that suffered from

it, this view might carry conviction with it. But there are hundreds of country-bred horses that are never washed on the head and limbs, there were some studs where for certain reasons this practice was prohibited, and yet Bursatti was as prevalent among these as elsewhere.

To our readers we commit the facts of the case as we know them, for their reflection and judgment, proceeding to details of our own observation bearing on this section of our study—*the histology of Bursatti.* Collectively, we venture to think, they were the first stone left unturned in the search that led to the detection of a chain of circumstances better known commonly, perhaps, under the name of "symptoms." From their consideration was inspired a reliable knowledge of and acquaintance with the radix of the disease. Nor manifestly can pathology ever take rank among the exact sciences until the nature of the disease it treats of has been unmistakably ascertained. I have everywhere endeavoured to supply the ground or wherefore of what I advanced, rather than leave anything to conjecture, whenever a rational cause could be adduced. I grounded and reconciled all my conclusions on a combination of physical, chemical, physiological, pathological and clinical proofs, proofs which exert the strongest influence in shielding from oblivion the close relationship that subsists between human Cancer and equine "Bursatti" in every phase and particular, and which have been fully borne out in responses to questions put by correspondents to the VETERINARY JOURNAL, a correspondence that has helped to clear up, in our opinion, certain points of our contention otherwise left unexplained. I have also since become aware, verbally, that some twelve years or more before my own announcement, Mr. Kettlewell had unhesitatingly decided, and pronounced the *histologic character* of Bursatti to be similar to that of Cancer. Thus it must be admitted that to I. V. S. Kettlewell, equally with ourselves, does the merit of the opinion apply and belong.

Having so far dwelt on the introductory part of this subject in relation to its history, I will notice very briefly the subject of histology proper in connection with Bursatti, and endeavour to discriminate the unquestionable cancerous changes that present themselves.

In every pathological investigation we must, as microscopists, carefully note the histologic characteristics that harmonise with *health;* as any departure from this will obviously constitute a pathological product, which is thus identical with *disease;* insomuch that, when examining any tissue the constitution of which we are already cognisant of, the presence of any flaws in the ordinary arrangement of the constituents becomes a matter for suspicion on the part of the practised pathologist, since it must now be availed of as an invariable sign of inherent disease.

It appertains to the pathologist to determine the nature of that disease change, and hence it is that a pathologist, to be successful, must be a histologist.

We proceed with a retrospect of our observations (*supra*) on the histology of this disease, and for this purpose divide our work into the consideration of its

(*a*) Macroscopic, and
(*b*) Microscopic appearances.

(*a*) A thin section on a slide, and placed before the light, shows (*vide* VETERINARY JOURNAL, July, 1881, pp. 20, 21, 22, 23)—V.S. Smith, of the 12th Royal Lancers, believes, that some of the fibres here described are of the nature of "hyphal tubes," and speaks of them as showing bright extremities, rendered yet brighter by the addition of glycerine, of Liq. potassa, etc., and describes them as manifestly hollow bodies. We regret being unable to agree with the views of one who has bestowed so much study on this subject; but our own scrutiny leads us to think that the rods above described are neither more nor less than coarse (yellow elastic) fibres. Although commonly solid, these latter frequently present crevices, fissures, and cavities.*

Cells.—(*Vide* VETERINARY JOURNAL, July, 1881, pp. 23, 24.) In his description of the cells peculiar to Bursatti structure Mr. Smith gives what to us seems undue prominence to a matter which would appear of little practical value, although we are not disposed to reject it without giving it its legitimate consideration. He throughout emphasises the "pigmentation" of the cells common to many specimens, as attaching to it some special

* Prof. W. Rutherford's "Physiology." Part I. 1881.

consequence from the standpoint of its pathological character whereas, those conversant with the views of modern pathologists will see that this goes to explain but very little of the *etiology* of the disease under consideration. I may here mention that in support of my statements I can point to the authority of Sir James Paget, who notices, in his "Literature of Cancer,"* that the "pigmentation" of the cells observable in cancerous disease is entirely an accidental phenomenon, having nothing in common with the pathology of the disease; *i.e.*, it fails to point to any specific bearing on the nature and causation of the disease. And for these reasons we are warranted in judging with Sir James, that the omission of any special mention of pigmentation as an accompaniment of the cells would create no appalling void in the pathology of this disease.

Moreover, we would urge that pigmentation, instead of offering a clue to the causation of the disease, on the contrary, gives evidence only of its *results;* it is therefore not pathogenic. Nor is it through *results* that the pathologist arrives at his conclusions. He hopes to elucidate the nature of disease rather by their ultimate *causation.* And this view, we confidently think, will receive a ready echo from all observers. On this head it would appear expedient to amplify further (*vide* VETERINARY JOURNAL, July, 1881, p. 24, last line; then pp. 88, 89, VETERINARY JOURNAL, August, 1881).

Before quitting the subject of the cells common to Bursatti growths, I would lay the greatest stress on one characteristic especially distinguishing them—their peculiarity of settling or ranging themselves, in the process of the rapid growth of the sores, into peculiar concentric layers, being piled up, as it were, one upon another, in rotation, forming well-defined round or slightly oblong bodies, which in maturity become visible to the naked eye, and can be manipulated by the fingers, and in this way dislodged from their situations. To these bodies the name *kunkur* has been given. *On their exact pathology a good deal of controversy has lately been expended.* Inasmuch as I have already amply explained the nature, formation, and pathological significance of these in another chapter, I may omit it in this page,

* "Surgical and Pathological Lectures," by Sir James Paget.

except just to remark that *their inception is dependent entirely on the characteristic arrangement of the cells peculiar, not only to Bursatti growths in the horse, but to Cancer structure generally*, instances of which have been pointed out by Billroth, Abernethy, Wilks, and Moxon, and other authorities; and that inception is expedited by a process of *calcareous* deposition that obtains in all morbid products during their later stages in the equine patient even in excess of that incident to the human subject.

The importance of combining medical with veterinary aid, and *vice-versâ*, can hardly be over-rated, as circumstances present themselves in both where the one is powerless without the appliances of the other. And so it is only by both professions mutually consulting their theories and facts of experience that we may hope to compromise the risks attendant on an exclusive, one-sided engagement with disease, whether as affecting the organism of man or the lower animals. The recent light and disclosures on the nature and pathology of hitherto ill-understood disorders among the animal creation—disclosures effected as results of such co-operation—establish this fact beyond cavil or dispute. Most certain it is that the more this co-operation is developed the more we may hope to find evidence of how many diseases belonging to the lower animals are directly or indirectly related and incident to the higher, viz., man.

Having offered the foregoing observations, I propose very briefly to consider that section of our chapter which may be said to be the most practical in the histology proper of this department of Bursatti. After quoting the views of one or two medical authorities on the difficulties to be overcome in the determination of Cancer structure, a difficulty apparently overlooked by some writers, I shall endeavour to point out the principal obstacles in the task of discriminating that unique presentment of structures peculiar to the formation and growth of Bursatti. In a lengthened discussion at the French Academy of Medicine (*Monthly Journal of Medicine*, January, p. 64; February, p. 166; and March, 259, 1855) respecting the diagnosis of Cancer by means of the microscope, though almost all the speakers—Malgagne, Amussat, Cloquet, Delafond, Bonillan,

Rostan, Robert, and others—agreed that the Cancer structure contained cells, yet they were not agreed as to the cells being characteristic of the disease. Velpeau says*: "For thirty years I have constantly applied the great law of Bichat (cited by M. Robert) to everything in pathological anatomy. But in pathology, anatomy, though very necessary, is not all-important.". . . "The recurrence of Cancer tumours containing no cancer cells has convinced me that the cell is not the pathognomonic sign of Cancer" (p. 170, February No.). It will further be seen that the opinions of Beale, Bastian, Simon, and some of our best histologists in England, also lean in the same direction.

(*To be continued.*)

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 171.)

According to this learned professor, it is sufficient if one of these characteristics is present to justify the rejection of such flesh for human food.†

The principles enunciated by Gerlach have been very differently estimated by competent authorities. *Some pretend that the flesh of tuberculous animals is not fit for food in every case; they adopt more or less the opinion of Gerlach, and demand that an investigation should be made as to whether the flesh is injurious, whatever the development of the disease may be, or if it is only so when it has reached a certain stage, and what that stage really is. Others completely adopt the views of Gerlach;* and others, again, *maintain that the temperature of boiling water destroys the morbigenous principle of Tuberculosis, so that the flesh of animals affected with this disease may be consumed with safety, provided it has been previously boiled* (Lothar Meyer, Decroix); *and they accept the views previously enunciated by Payen, Renault, etc.*, while others are of opinion *that indecision in such a question is inadmissible, and that a conclusion should be arrived at as to whether or not the flesh of such animals should be eaten* (Semmer). *Certain*

* *Monthly Journal of Medicine*, January, p. 64, 1855.
† "Die Feischkost des Menschen."

authorities, as Zundel and Johne, assert that, with regard to the utilization of this flesh, the opinion prevailing in South Germany, for instance (see p. 170), *should be maintained; and some others consider the question as not yet solved, and ask for further investigations.*

The Imperial German Veterinary Council seems to entertain the latter opinion, for at a meeting held in Berlin in 1875, the following conclusions were voted :—

"1. The facts and observations collected up to date, with regard to bovine Tubercular Phthisis and caseous Pneumonia, and more particularly with respect to their transmissibility to mankind, merit attention, but they are not conclusive, and especially do not suffice to convince us as to the danger of Tuberculosis being transmitted to the human species through the medium of the flesh and milk of animals affected with this disease, and to justify prohibition of the sale of these products ;

"2. The permanent bureau is authorised to apply to the Chancellory of the Empire for the means necessary to solve the question if, and to what point, the consumption of the flesh and milk of tuberculous cattle is injurious to human health."

The direction of the Berlin Veterinary School, consulted in 1878, in a legal dispute on this subject, in its arbitrative capacity, gives an even more reserved opinion than the German Veterinary Council. The following are the terms in which it gives its views : —"It is not yet proved that the flesh of a cow affected with generalised Tuberculosis, but otherwise very fat and well nourished, may not be utilised as food for man ; the scientific experimental researches undertaken with this object have not yet demonstrated that the opinion expressed by different experimentalists, that the flesh of a tuberculous cow, especially when the organism is largely involved, contains an injurious specific principle and ought to be excluded from human consumption, is erroneous," etc.

Johne,* who of all others has best treated the question from a practical point of view, thinks that Gerlach went too far in considering the flesh as hurtful when the disease had invaded the lymphatic glands in proximity to the tuberculous centre.

* "Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie." 1883. Heft 1, 2.

According to Johne, to produce a really injurious effect, *generalised Tuberculosis* must be present—that is to say, the nosogenous principle of tubercle is no longer confined to the peripheral lymphatic circulation, where it was more or less localised, but has reached the thoracic duct and the vascular system, and is diffused all over the body. Whatever may be the species of animal intended for food, if it is affected with Tuberculosis, *and yet the carcase does not present the characters of tuberculous metastasis*—that is, generalised Tuberculosis—infection of the flesh cannot be admitted, and there is no necessity for condemning it, so long as the tuberculous organs, as well as the vessels and lymphatic glands along the course of the circulation from the affected organs to the thoracic duct, are not allowed to be consumed as food. In order to be more certain of safety, the neighbouring vessels and connective tissue surrounding them should also be removed.

With regard to the flesh, Johne remarks that no matter what the condition of the animal may have been, it should be considered as free from danger; at most it is of inferior quality, and should not be rejected if there is no other cause.

It is not the same if the presence of the above alterations renders it probable that the blood is infected. In such a case the entire carcase, no matter how high the condition of the animal may have been, should be seized, as it is unfit for food.

Gerlach and Johne are agreed in maintaining that emaciation is not a necessary manifestation of general infection, as animals affected with pulmonary, hepatic, or intestinal Tuberculosis sometimes waste rapidly without the disease becoming generalised; but cattle suffering from well-marked pleural or peritoneal Tuberculosis may preserve their condition for years, and even fatten—though this fact does not prove that they may not at any moment succumb to general infection.

Zundel is of opinion that, so far as injury or danger from the use of such flesh is concerned, up to the present time only theoretical considerations, based on imperfect experiments which are opposed to the facts derived from close observation, have been invoked. Such opinions cannot retard those measures which are devised with a view to protect the public health; if they

were accepted, a tenth part of the meat actually consumed without inconvenience would be withdrawn from consumption. The discovery of Koch, he adds, shows that the parasite of Tuberculosis is only met with in the pathological productions characteristic of this malady, and are not diffused, like certain other of the infectious diseases, throughout the whole of the juices of the body, nor yet in the blood ; and it is for these reasons that the *Bacilli* are not found in the flesh. As a result, says this learned Principal Veterinary Surgeon of Alsace Lorraine, it follows that the practice hitherto pursued should be in no way modified, and that, as in the past, only the flesh of wasted and wholly infected animals should be interdicted as food ; the utilisation of that which is derived from cattle less diseased may be allowed, if it be recommended to consume it only after it has been well cooked.

If, as is shown by what has been adduced, very diverse opinions have been given on this subject, yet no one has ventured to assert that nothing should be done to prevent the evil consequences likely to attend the use of the flesh of tuberculous animals ; on the contrary, the universal opinion is *that sanitary police measures should be adopted to avert the injurious influence of such flesh.*

The desire of those who, for some years, have considered this question as not capable of solution, and who, for this reason, have urged the necessity there is for new experiments, has been gratified.

These experiments have been made and repeated, and when they have been conducted with proper precautions they have yielded positive results. The *Bacillus* of Tuberculosis has been recognised, isolated, cultivated, and transmitted by inoculation ; whatever may have been the soil from which it has been transferred (man, animals, gelatine, etc.), it has always caused the development of true Tuberculosis in the animal into which it was transplanted, and it could always be transmitted from one inoculated animal to another. The experimental evidence is therefore complete, and the problem may be looked upon as solved. The response is affirmative with regard to the noxious influence of the flesh of tuberculous cattle, and the majority of those who were previously doubtful are now convinced.

If we exclude the opinion of those who believe that the question is not yet sufficiently elucidated, the number of whom should now be very limited, we are finally brought face to face with two very different opinions as to the preventive measures which should be adopted:—

a. According to some, *all the preventive measures may be reduced to the simple advice to cook the flesh well before eating it;*

b. According to others, *the flesh of tuberculous animals should be confiscated, either in every case, or in certain circumstances.*

If the two solutions are examined with regard to their efficacy and their practical application, we are brought to the admission that the first is certainly that which will find the greatest number of adherents among the farmers and butchers, who will support it heartily. "They who eat the flesh or drink the milk," say they, "have only to take care that these are properly cooked; in this condition they are not hurtful, as the temperature of boiling water kills the tubercle parasite, and thus removes all danger of infection."

Cooking is, it must be confessed, a precious means of disinfection—a means which it would be difficult to replace with advantage, when it is desired to ensure the healthfulness of food. While in the North of Germany, where much flesh is consumed in a raw state, it is not possible, even with the aid of the microscope, to prevent outbreaks of Trichinosis; in those countries where meat is nearly always well boiled or roasted that disease is either very rare or unknown, although it may be that nothing more is attempted as a preventive than a facultative inspection and the advice not to eat raw flesh.

The recommendation to consume only cooked flesh and boiled milk is certainly commendable, in order to prevent Tuberculosis in those countries where the recommendation does not clash with deep-rooted manners and customs. Where people are in the habit of consuming raw or imperfectly cooked meat, such a recommendation would not be followed; and as a proof of this we may note that the extensive outbreaks of Trichinosis in North and Central Germany, have not yet caused the neighbours of the unfortunates who succumbed to the malady to abandon the use of raw pork.

When the recommendation to properly cook meat is not favourably accepted by all ranks in society, it cannot be considered a practicable measure for a State which does not wish to resign itself to the *laisser faire* and the *laisser aller* principle, with all its consequences.

That which has just been said with regard to the recommendation, applies with equal force to the prohibition. An inconvenience which is added to the latter, besides non-observance, is that the profane, confiding in the application of the recommendation or prohibition, may believe that *all* cooked flesh is innocuous, which is not exactly correct.

The temperature of boiling water kills the *Bacillus* of tubercle, but this temperature is not attained throughout the whole mass of a piece of meat prepared for consumption ; the portions insufficiently heated may therefore preserve their infective property ; and on the other hand, the germs and spores of the *Bacillus* may resist this temperature and retain their germinative power. (See the experiments of Gerlach and Toussaint.)

If, as a general rule, flesh-food is not perfectly cooked, is not even exposed to the temperature which alters the colouring matter of the blood, ordinary cooking can neither be recommended nor ordered as an efficient preventive, so far as flesh is concerned.

Besides, the question may be looked at from the other side. When we have to consider, in such a case, the preventive measures necessary, it is not alone the interests of the butchers and breeders, that is, the providers of flesh, which should be taken into account ; the consumer should also have a voice in the matter, and his manner of looking at it should even have a preponderating value. He who pays in money for the entire value of the meat he purchases, has a right to expect a corresponding quality in what he buys. In those countries where he is protected by the law, which prohibits the sale of putrid flesh, or that from diseased beasts, the consumer would protest energetically if he were required to purchase that of phthisical or marasmic animals as good and genuine food. Even those who maintain that in no case should we confiscate the flesh of tuberculous animals, and that it is sufficient to boil such flesh,

would not have it offered for sale to the generality of the public (Payen, Renault, Decroix, Lothar Meyer). It is for this reason that Lothar Meyer wished that such flesh should be sold in those places where poor people are supplied with food, as the common cook-shops (*Volks-Küchen*), etc. It is true that this proposition should not be looked upon in the light that the poor are better able to digest such food than the rich, but rather that it is only brought forward on the ground that in hospitals and cook-shops the cooking of animal food is better attended to, and that in accepting such a proposition we are preserving for the poorer section of the population innocuous food, which, under ordinary conditions, would usually be lost.

Although Meyer's proposition might, from a philanthropic point of view, be perfectly justified, it would nevertheless appear, if carried into practice, as if it were intended to make poor people eat flesh, perhaps diseased, which was not good enough for the wealthier classes. The moral effect of such a measure might have more serious consequences than the material and pecuniary losses entailed by the confiscation of animals affected with Tuberculosis.

These are all the remarks we have to offer on the recommendation or obligation to *boil* or *roast* the flesh from tuberculous cattle—a measure which, it must be admitted, is useful and acceptable, but in no way sufficient; and it is these considerations which compel us to notice the other measures which have been proposed.

The second essential proposition which has been put forward, is relative to the *confiscation of the flesh of tuberculous cattle in every instance, or at any rate in certain determinate cases.*

Confiscation in every case would certainly be the most efficacious measure for the preservation of human health. From the veterinary surgeon's point of view, it is unobjectionable, as the diagnosis of the malady is usually very easy, and in difficult and doubtful cases a microscopical analysis would suffice in order to arrive at a decision.

But on the other hand, putting the necessary measures into practice offers numerous difficulties. The old proverb that "The judges of Nuremberg do not hang a man until they have

laid hands upon him" is perfectly applicable here, as it is first requisite to know where the tuberculous flesh is to be found before it can be confiscated. The discovery of such flesh must form part of a most difficult task, as to attempt it an invasion of the domain of the butcher and breeder must be made, and this would provoke a conflict all the more serious as the measure would prove effective; and this is not a hypothesis, but a statement founded on everyday experience.

Partial confiscation, that is, the confiscation of certain kinds of flesh, is, as has been already said, carried out in certain countries, where it is even enforced as a legal measure. Simple prohibition, even when supported by the threatened infliction of a penalty in case of infraction, will not cause butchers and farmers to make a report which may lead to the confiscation of their diseased animal. The dread of the butcher lest the reputation of his establishment should be tarnished through the intervention of the police, induces him to conceal the malady, and all the more readily, as declaring its presence would cause him notable material loss. For these reasons, animals intended for slaughter, abattoirs, and the sale of flesh, have all been placed under the control and surveillance of the police (except in England), for it is only the constant imminence of such control with regard to meat exposed for sale, that gives efficacious support to the announced penalty; and it is the same imminence of control which causes the butcher to conform to the law when he knows he cannot elude it.

The obligation to have all animals intended for food slaughtered in abattoirs and under the surveillance of competent persons; the prohibition of transporting meat, and fresh preparations of meat, instead of killing the animals in other districts; the severe surveillance under which this transport may ultimately be allowed to take place, and an incessant inspection of the butchers' shops—all these are measures of real efficiency against the sale of the flesh of tuberculous cattle.

Notwithstanding all the prohibitions, animals affected with this disease are nevertheless clandestinely slaughtered; as the farmers, the dishonest cattle-dealers, and the low-class butchers are always ready to make the most out of a diseased beast.

In the Grand Duchy of Baden, where a system of meat inspection has been for a long time organised, it is generally admitted by those who are competent to form an opinion, that about 20 per cent. of tuberculous cattle escape inspection.

The sanitary police measures in force (on the Continent) would act in a less satisfactory manner in preventing the sale of such flesh, if they were not to a certain extent seconded in their action by the fact that, from an early period up to the present day, this disease has been classed among those which caused any animal to be warrantable and returnable. The butcher who has, unknowingly, purchased a phthisical beast, incurs a loss which the seller must make good. If the latter does not consent to do so, then the butcher may institute an action against him, and thus make known the malady from which the animal is suffering.

There are, however, cases in which the rights of warranty are lost *a priori*, and in which, consequently, public proclamation of the disease does not take place. Many farmers, and particularly those who know the condition of their animals, or who have already been laid in damages in consequence of the existence of Tuberculosis among their cattle, sell *without warranty*, and usually to greater advantage than those cattle-owners who have confidence in the healthy condition of their animals. The butcher who buys without a warranty has no interest in declaring the existence of the malady which he may detect in the animals he has killed, or is about to kill ; he takes good care to kill and dress in a public abattoir the cattle he suspects are affected, and dresses the carcase, removing the diseased parts, and sending the remainder into the market for food. This is one of the least dangerous courses which may be followed in such cases.

Much more serious consequences may result if this flesh is sold to be manufactured into sausages. The manufacturers of these desire a good profit on the meat they buy, and they find this most readily with the owners of cattle who sell without giving a warranty ; it is more especially these persons who use up for food the carcases of phthisical cattle which have been in an advanced stage of the affection. In preparing these sausages, all kinds of meat, healthy or diseased, are chopped up together,

and a mass is obtained which is at least disgusting to the eye, and which, being often consumed in a raw, or half-raw state, may compromise the health, and even the life of those who eat it.

The laws of warranty* come therefore to the aid of the sanitary police measures, so far as tuberculous cattle are concerned; but they are as insufficient, as the best-organised system of meat inspection can be, to prevent the noxious action of their flesh in the most serious cases of this disease.

And to-day, as it was during the past century, when all the flesh of a tuberculous cow was given to the knacker, those persons whose interests suffer through these sanitary measures attack the laws or regulations concerning meat inspection, and it would appear that they will not renounce their procedure until these are absolutely abandoned, as has happened before.

The following instance may be cited as evidence of what is now stated. When, inspired by the writings of Gerlach, certain meat inspectors in the Grand Duchy of Baden, among whom may be mentioned Veterinary Surgeon Fuchs, of Mannheim, attempted to apply a little more rigorously and conscientiously the measures prescribed in the regulations for the inspection of tuberculous cattle, the butchers and owners of stock acted in such a manner that serious consequences were apprehended. The latter declared that they would no longer sell to the butchers of Mannheim, or at least that they would not be bound by warranty; and the butchers, on their side, pretended that before submitting to all the risks attending the soundness of meat, they must insist on raising the price. Other butchers announced that they would no longer slaughter in the town abattoirs, but would bring into the town all the meat their customers required. In proceeding thus, the butchers, like cattle-owners and cattle-dealers, threw all the extra charges on the consumer, who, without taking into account the fact that he was all the better protected in his health by receiving better meat, saw only in the application of these severer sanitary measures an attack on his pocket. And the butchers, on the other hand,

* We have nothing like the *lois sur la redhibition* of the French, the *Gewährsmangel* or *Gehwärsleistung* of the Germans.—G. F.

endeavoured to escape from the more severe control, thus further diminishing the guarantee due to the consumer. Such a state of things could not go on, and the more severe measures to which recourse was had for the moment, had to give place to the less rigorous ones previously in force.

If, in order to prevent clandestine slaughter, resort be had to domiciliary visits, rewards for information, etc., considerable police expenses will be incurred, and this without any certainty of achieving the desired result. The persons who keep hotels and boarding-houses of an inferior class, would still remain the customers of those who slaughtered phthisical cattle without informing the authorities. The more the unenlightened public continue to ignore the danger they incur in consuming such flesh, or to doubt the reality of this danger, the more they will consider the application of these preventive measures as a new and useless vexation emanating from the police, and be inclined to resent the more active intervention of the authorities.

If the confiscation of tuberculous cattle has already met with great difficulties when carried into practice, these difficulties are much increased when attempts are made to determine in what cases flesh may be admitted for consumption, and in what cases it should be prohibited; and *technical difficulties* must also be added to the list.

When it is decided to seize *all* the flesh of phthisical cattle, it suffices to establish the existence of the lesions of Tuberculosis, in order to decide if the flesh of a tuberculous beast *may* or *may not* be allowed for food. In the latter case, it is necessary not only to endeavour to determine minutely the extent and degree of development of the tubercular alterations, but we ought also to know how and where to select the infected portions of the carcase from those which are to be utilised as aliment.

The knowledge necessary to meet all these requirements is only to be found combined in the veterinary surgeon who practises these inspections.

Some authors, who, like Gerlach, are of opinion that there may be admitted as food certain portions of the flesh of tuberculous cattle and other portions refused, recognise the difficulties to be encountered when one is required in such a matter to

decide in a given case; then the most experienced and skilled practitioner will often find himself embarrassed.

In treating of these difficulties, Gerlach, among others, says:—"When we have to deal with things, and have arrived at that point that we must differentiate between them, we may always arrive at opposite conclusions. If it is already very difficult to trace a limit between health and disease, it is still more difficult to establish exactly the moment when the virulent principle of a morbid process, primarily localised, becomes generalised in the organism. If on such a limit or frontier conflicting interests meet, we need not be astonished that divergent opinions may arise. The meat-inspector will perhaps demand in a given case the absolute rejection of the flesh of a diseased animal, and the breeder or dealer—in a word, the owner of the animal—will claim that the flesh may be perfectly fit for consumption; the latter will only yield to confiscation when there is nothing to reject—that is, when the animal is so diseased that its carcase is worth nothing."

In cases of dispute as to the use of the flesh of a phthisical cow, it is necessary, according to Gerlach, to have recourse to the arbitrament of a veterinary surgeon who, in such a case, may judge with competence and impartiality. In giving judgment, he should preserve the flesh which there is reason to save, *without endangering the health of man, the consumer.* "When his scientific knowledge does not enable him to separate the noxious from the innocuous, and doubt persists, the expert should admit the existence of danger and, consequently, in such cases decide to *reject* the flesh, maintaining his opinion so long as the innocuousness of the meat is not established."

Johne also maintains that, in order to ensure a good inspection of meat, public abattoirs are necessary, as well as a corps of inspectors composed of veterinary surgeons, well posted up in the scientific work of their profession, and competent in the practical work of inspection.

According to Zundel, meat inspection, in so far as Tuberculosis is concerned, should, in country as well as in town, be a general measure, applied with intelligence, and based on well established facts.*

* "Nature Parasitaire de la Tuberculose." Strasbourg, 1882, p. 14.

Although in southern Germany it has for a long time been the custom to class the flesh of tuberculous cattle in several categories, notwithstanding a strong desire to do so, it has not been possible to replace an empirical by a rational inspection. So long as private interests are, in the general interest, likely to be injured by way of judgment, so long will there be a disposition to sacrifice right to sentiments of indulgence ; judgment will be generally in favour of him who is injured, if for the injury he is not responsible.

In order to properly differentiate the flesh of tuberculous cattle which may be allowed for food, from that which cannot be admitted as aliment, it is necessary that in every district there should be a conscientious and independent inspector, or a person specially selected for this duty, whose exclusive function would be the inspection of meat in that district. This would, of course, cause considerable expense, which would have to be defrayed by the Government, the districts, the consumers, or the butchers.

In addition to the expense, there is another difficulty connected with this preventive meat-inspection, and this is a consequence of the sometimes very narrow limit existing between the flesh which is consumable and that which is not. The more or less hypothetical indications met with in medical literature, do not furnish a sufficiently positive basis for the determination of this limit. The possibility of transmitting Tuberculosis through the medium of the milk furnished by tuberculous cows, would lead to the supposition that *apparently localised Tuberculosis does not always consist in alteration in certain organs only.*

(*To be continued.*)

Editorial.

THE PROPOSED VETERINARY COLLEGE FOR IRELAND.

We have before alluded to efforts which are from time to time made towards the establishment of an Irish Veterinary College, and every few weeks letters in favour of the proposal appear in the Dublin newspapers. The idea is to have not only a teaching school, but also to confer upon it the power of granting diplomas. To the establishment of a teaching college, provided it be placed on a proper and efficient footing, and adequately supported, there can be no objection; but that it should also give a diploma, carrying the same privileges as that of the Royal College of Veterinary Surgeons, or any diploma, we consider in every way objectionable, and opposed to all the true interests of our profession. We have now one active and zealous governing body, the duly elected representative assembly of the profession, the Council of the Royal College of Veterinary Surgeons, which has the sole power of regulating the quantity and quality of the examinations, and of thus securing, as far as possible, a uniform standard of knowledge and efficiency, no matter from what school the candidate may spring. The advantages of having one supreme Council would appear to be sufficiently obvious, yet, over and over again, they are, in writings on the subject, quietly ignored, and the general public, being imperfectly informed, is therefore unable to grasp the true state of the situation. A considerable sum of money would be required to start and maintain a veterinary college in Dublin, as suitable buildings and appliances, and an expensive staff of paid professors would have to be provided. As those who are the most ardent advocates of the scheme do not appear to believe it feasible without the assistance of a Government grant, its establishment might be considered somewhat remote, when we remember that State aid has hitherto been altogether withheld from our once struggling profession, which has, however, at last, through its own unceasing exertions and perseverance, become a real power in the land.

The efficient education of our students must ever be an anxious and important subject, and we should strive rather to obtain quality than quantity of teaching schools, so that we may make our final examinations for the diploma much more searching and severe, especially in the practical part; in short, we have pressing reasons for earnestly wishing to raise the general standard of the professional knowledge of those who present themselves for admission to the Royal College of Veterinary Surgeons. The severity of our examination tests has of late years been gradually increased, so much so as to now keep out those who thought the degree of veterinary surgeon one to be easily and cheaply obtained. We must, however, still advance, for we have not by any means reached the final point of excellence. Very many members of the profession now think that, comparatively speaking, we have too many teaching colleges, and that one in Scotland and one in England would be amply

sufficient for the requirements of the country. The proposal for an Irish veterinary college assumes no shape owing to want of funds; but would a sufficient number of students be found in the country itself to support it? Even its advocates doubt this, as is shown by their suggestion that the pupils might obtain the necessary acquaintance with the practical part of their education by attending the premises of eminent veterinary surgeons in the city of Dublin. Would these practitioners, however, consent to give the necessary facilities for doing this? We may almost certainly answer in the negative. It is, we fear, a too common popular error to think that the formation of a few classes, with two or three lecturers, is all that is requisite to constitute a proper veterinary teaching institution, but they who cherish such an idea will soon find that reduced to practice it can only result in disastrous failure. Whenever a proper teaching veterinary college is started in Dublin, it will be found that much more money and other advantages will be necessary than its advocates appear to have calculated upon; in a word, the expenses will be very great, and there does not seem to be much probability of that government aid being extended to it which has, thus far, as before said, been denied to our profession as a whole.

After years of painful effort and much contention, we have only recently succeeded in removing the opposition of the Highland and Agricultural Society of Scotland, and induced it to cease giving its certificates to practise, and we have therefore—happily for progress and efficiency—only one gate of entry to the diploma. To open another door by granting separate licensing power to Ireland would lead to agitation in Scotland for a similar privilege. The ultimate consequence would be that we should have three different diploma-conferring bodies, and then we should, in all probability, witness a competition to see which could attract most students for its own pecuniary advantage by furnishing diplomas after an inefficient course of study and an easy and untrustworthy examination; in fact, this is only what all experience of professional examinations in any avocation would, under such conditions, lead us to expect.

The medical profession is striving in the face of much opposition to obtain one supreme council to control all its diploma-conferring examinations, which great advantage, its more enlightened members are well aware, would immeasurably increase the standard of technical knowledge and efficiency of those who enter it. We already possess this inestimable privilege, which we should diligently guard, for it is one which cannot be used for any selfish motives; it can only be employed for the benefit of the whole country. We have good reason to believe that, with very few exceptions, Irish veterinary surgeons are strongly opposed to the granting of licensing power to any other body than the existing Royal College of Veterinary Surgeons, of which every member, be he English, Irish, or Scotch, possesses an equal vote in the election of the Council. The profession, therefore, should be entirely free from any jealous and mistaken feeling of nationality, which can only result in disunion and disadvantage.

SERIOUS ILLNESS OF DR. FLEMING.

We much regret having to inform the readers of this Journal that Dr. Fleming, Principal Veterinary Surgeon to the Army, has lately been very seriously ill, and although now on the fair road towards complete recovery, it is feared that some months must elapse before he will be able to resume his regular duties.

Of the cause of the illness there can be no doubt. It was brought on solely by excessive mental labour. Those most intimately acquainted with Dr. Fleming are well aware that in addition to carrying on his military engagements, his life is passed in incessant toil, as editor or author of various veterinary publications, or in other ways labouring for the advancement of our profession. Of what he has already achieved in that direction by the sacrifice of time, health, and money, it is needless to speak, and we feel assured that if the good wishes and earnest hopes of the members of the profession, and of numerous other friends, be of any avail, the health of Dr. Fleming will be speedily restored, and his life spared for many years to his family, with whose present affliction we all most deeply sympathise.

M. PASTEUR ON HIS EXPERIMENTS.

A Copenhagen correspondent writes :—"On Monday afternoon, M. Pasteur delivered a very interesting address at the Medical Congress upon Hydrophobia and his experiments of inoculation. The address was delivered in the great festival hall of the university, in the presence of about 1,200 members of the Congress, and was very much applauded. The first part of the address was mostly a repetition of former statements, but at the end M. Pasteur gave some fresh and interesting information. When he had discovered the method of vaccinating dogs, and in this way made a great many insusceptible to Hydrophobia, he requested the French Government to appoint a competent committee to judge of the results. This request was granted by the Minister of Education, M. Fallières. The committee had sent its report to the Minister, and the following were the most important points :—M. Pasteur gave twenty-three vaccinated dogs to the committee. Nineteen non-vaccinated dogs were selected by the members. On June the 1st, contagious virus from a rabid dog was inoculated into two vaccinated and two non-vaccinated dogs. On June the 3rd, one vaccinated and one non-vaccinated dog were bitten by a rabid dog. On June the 4th, one vaccinated and one non-vaccinated dog were bitten by the rabid dog. On June the 6th, the rabid dog died, and contagious virus taken from it was inoculated into three vaccinated and three non-vaccinated dogs. On June the 10th, one vaccinated and one non-vaccinated dog were bitten by another rabid dog. On the 17th, one vaccinated and one non-vaccinated dog were bitten by one of the non-vaccinated dogs, which had become rabid after the inoculation on the 1st. On the 20th, six vaccinated and four non-vaccinated dogs were inoculated by injection into the veins. On the 28th, two vaccinated and two non-vaccinated dogs were bitten by a rabid dog. The following results are given by the committee :—Of the nineteen non-vaccinated dogs three of the six bitten by rabid dogs became rabid ; five of the seven inoculated by injection became rabid, and all the five otherwise inoculated became

rabid. Among the twenty-three vaccinated dogs not one single case of Hydrophobia took place. One of the vaccinated dogs died on July 13th from ordinary disease. Some virus from the dog was inoculated into three rabbits and a guinea-pig, all four animals are as yet quite well, a certain proof that the dog did not die from Hydrophobia. The committee intended to vaccinate twenty dogs, and see if these would show themselves insusceptible to Hydrophobia. M. Pasteur finished his address by stating that animals are proportionally less infected by bites from rabid dogs than from inoculation. He emphasised the remark that his experiments had produced results on animals only, but he considered it most likely—was, indeed, perfectly certain—that if the dog could be made insusceptible to Hydrophobia, the source of that dreadful disease in man would be extirpated, and the great question as to the prophylactic, both for dog and man, would be solved."

MUTILATION OF HORSES' TAILS.

THE fashion of mutilating horses has now become so common that for the heavier kinds of horses required in the army it is sometimes almost impossible to procure a sufficient number without taking some which have been submitted to the injurious operation of "docking." As the military authorities have been advised to reject all such mutilated horses, because of their unfitness for service, the following Horse Guards Order was issued by H.R.H. Field Marshal Commanding-in-Chief on September 1st :—

GENERAL ORDER.—Horses.—As it has been brought to notice that in the mounted services the regulations in regard to the length of horses' tails are not observed, and as horses with short tails are practically unfit for service in the field, where flies are troublesome, the following addition will be made to para. 5, Sec. XI., "Queen's Regulations and Orders for the Army, 1883" : General officers, when making their inspections of mounted corps, will ascertain whether these instructions are strictly followed, and they will specially report every instance in which they are disregarded that come under their notice. Horses with short docks are not to be purchased as remounts.

OBSERVATIONS ON RICKETS, ETC., IN WILD ANIMALS.

BY J. B. SUTTON, F.R C.S., SENIOR DEMONSTRATOR OF ANATOMY, MIDDLESEX HOSPITAL.

(*Continued from page* 188.)

THE APPENDICULAR SKELETON.—The bones are not, as a rule, much affected; the chief changes are to be seen at the epiphysial lines. The growing lines are irregular, but "spongioid" tissue is absent, or very small in amount. Often a distinct layer of fibrous tissue may be observed at the epiphysis. Occasionally the shafts of the long bones present patches of osteophytic bone. Occasionally the periosteum is somewhat thickened, but this is by no means common, and in the majority of cases is limited to the neighbourhood of the epiphysis.

THE AXIAL SKELETON alone may be affected. Then beading of the ribs exists, the peculiar changes at the vertebral epiphyses, and thickening of the skull vault.

Lastly, the disease may limit itself to the skull alone, and occasionally the vault may be thickened without any other part of the skeleton being impli-

cated. The thickest skulls I have yet come across are those from animals in whose skeletons no other trace of Rickets could be detected.

Although the above account of Rickets occurring at puberty shows "hard-and-fast" distinctions between this and the early form, nevertheless every degree of variety may be met with, so that an animal dying from Rickets at an age intermediate to infancy and puberty, would display a pathological condition of skeleton partaking of the characters of the "infantile form" in its *appendicular* skeleton, but of the "later form" in its *axial* skeleton.

The essential point of difference is, that one form in its typical manifestation affects the limbs chiefly, whereas the other attacks, more or less exclusively, the trunk and skull.

The Museum of the Royal College of Surgeons contains a collection of skulls from lions and monkeys, many of which show the thickening of the vault, such as those I endeavoured to describe; though in most of the cases there is no information concerning the other parts of the skeleton, there can be little doubt that the cause of this hypertrophy must be ascribed to Rickets. In all these examples the character of the hypertrophy is very distinctive; instead of the usual arrangement into an outer compact stratum, then a layer of diplöe, bounded on its inner aspect by the vitreous table; the whole thickness of the bony vault is made up of porous, spongy, osseous tissue of uniform character throughout the whole extent.

An Anomalous Form.—Occasionally one meets with a condition of the long bones in monkeys which differs very materially from the variety of Rickets just described. The instances are by no means common, but important nevertheless. In these cases the animals seem near puberty. Their long bones present well-marked epiphyses, the cartilage lines are somewhat thicker than usual, "spongioid" tissue is present in small amount. The compact tissue of the bone shafts is very thin, but often firm and brittle, sometimes presenting bulgings near the middle, as though a bulb had been thrown there. The medullary cavity is very large, and in some cases is bounded below by the epiphysial cartilages, cancellous tissue being deficient or entirely absent; the medulla is diffluent, so that the condition of the long bone is as if it were an elongated nut-shell containing oil. The flat bones are soft, and their edges inverted, the chest deformed, the skull tabetic, and the spine kyphotic.

The only explanation I can offer concerning these cases is—That they may possibly be examples of Rickets occurring in "infancy," and that the proliferated material has undergone fatty degeneration, instead of organising. These cases are interesting, inasmuch as they present a marked similarity to the cases described by Dr. Rehn at the International Congress, 1881, and by Mr. Barwell, in the *Transactions of the Pathological Society*, and others, as examples of juvenile osteomalacia.

The Teeth.—Long ago Mr. Shaw pointed out that in the human subject, one of the results of Rickets was delayed dentition; this he attributed to the diminution of the jaws and large size of the teeth (*Med. and Chir. Soc. Trans.*, vols. xvii. and xxvi.) It was very surprising to find that in very young rickety animals the teeth were always in place, and normal both as to size and number. This is explained as follows:—Monkeys cut their milk teeth very soon after they are born, and many I believe enter the world with some of their teeth already above the gums, so that the temporary dental armature is complete before Rickets has time to manifest its baneful effects.

In examples of Rickets at puberty, the permanent teeth are delayed, retardation being due in all probability to extreme thickening of the dental follicle, which normally is as thin as tissue paper, but in these cases is as thick as the skin of the finger.

Rickets of Maturity.

This variety is the rarest of all. Few instances have come under my notice, and these have been chiefly among the Carnivora, but the French naturalist, Lataste, has made some observations on the subject, which to a certain extent supply the deficiency.

Symptoms.—The most characteristic features of the disease are deformity, paraplegia, loss of teeth, and fracture of the bones of the limbs, due in some cases to brittleness and tenuity of their texture; in other instances fracture results from softening of the bones. The disease attacks every part of the skeleton. The skull is light and porous; when macerated and dried, it becomes as light as cork; the alveolar margins of the jaws absorb, allowing the teeth to fall out prematurely. In some cases the bones in the recent state are soft, and yield easily to a knife, but when these soft bones are dried they become so delicate in texture that they may be crushed into powder between the thumb and finger. In the majority of instances the long bones are brittle, and break easily. Curves are commonly found in the long bones of the limbs. Deformity of the chest is uncommon.

The interspaces of the cancellous tissue are large. In rodents living in captivity, this affection seems fairly common, affecting more particularly the females, and Lataste found that in his specimens the bones were soft, and cut as easily as gelatine.

It should be carefully noted that care is very necessary in drawing conclusions from dried museum specimens. Frequently have I observed bones which were as soft and as flexible as gutta-percha, when recent or kept in spirit, become hard, brittle, and porous when dried for the museum shelves. Hence it is an important point to keep typical examples of bone disease in a moist condition. It appears exceedingly probable that very many of those porous, mortary-looking skulls and bones exhibited in museums as examples of "Osteoporosis" were, when recent, really soft and yielding bones in many instances. That there is some foundation for such an opinion will be shown by some cases now to be described.

Mr. Solly, in his well-known paper in the "Medico-Chirurgical Society Transactions," xxvii., writes as follows:—"I find that Mollities ossium is not confined to the human species; for I have learnt from Mr. Spooner, the Professor of Anatomy at the Veterinary College, that a year or two ago they had some hounds there belonging to Lord Middleton, the bones of whose skeletons were softened, the disease attacking one bone after another. A *post-mortem* examination of the bones exhibited the same morbid appearance I have described as occurring in the human subject—the deposit of red matter and great vascularity of the cancellated and laminated structure of the bone."

The *Veterinarian* for September, 1860, contains a "paper," by Varnell, of the Veterinary College, London, entitled, "A peculiar and unusual disease of the osseous tissue in the horse, resembling, in many of its characteristics, Mollities ossium, Rachitis, Osteoporosis, and fatty degeneration of bone."

In the very careful account given of this specimen, the following facts are of the greatest interest:—The bones generally were so soft that they could be cut with a knife in any direction, with the greatest ease. The cancellous spaces were filled with a red gelatinous substance.

The animals were four and five years old.

The skull is preserved in the Museum of the Veterinary College, London, with some other skulls and bones similarly affected, which, through the kindness and courtesy of Principal Robertson, I have had every opportunity of examining. Mr. Varnell's original specimen was exhibited at the Pathological Society of London, and is described in the "Transactions" for the years

1859-60. The lower jaw is preserved in the Museum of University College, London. Careful examination of all the specimens has convinced me that these bones are affected with "Rickets of maturity," and that the peculiar "osteoporotic" appearance they present is produced by maceration and subsequent drying.

Mr. Varnell, in his very clear account in the *Veterinarian*, distinctly states that "the bones were soft, and could easily be cut with a knife." At the present time these bones present the dry mortary appearance so characteristic of the so-called "Osteoporosis."

Microscopically, these specimens show enlargement of the cancellous spaces and Haversian canals, the latter often being separated from neighbours by a very thin lamina of osseous tissue.

By far the most interesting of these cases is one reported by Paul Gervais, in the *Journal de Zoologie* for 1875. It concerns some bones found near Vienna, which Brandt, in the *Cetaceen Europa's*, 1873, considers to belong to the Cetacea, and names it *Pachyacanthus*. From the figures given by Gervais the ribs and vertebræ present a condition allied to this so-called "Osteoporosis"; but the vertebræ are remarkable, inasmuch as they show a considerable narrowing of the spinal canal, so that the spinal cord must have been much compressed by the obvious overgrowth of osseous material. It was through carefully following this case that I was led to explain the cause of Paraplegia in rickety animals. Before perusing the account of this case the existence of general narrowing of the canal for the cord by bony overgrowth, or softening of the component vertebræ, seemed too strange and novel; but, as has been shown in the preceding pages, the application of information thus gained was crowned with the happiest and most satisfactory result, and has afforded a clear explanation of a symptom, which, though well recognised as such, had never had its cause investigated in a proper way. This narrowing and yielding of the vertebræ throws light on symptoms observed in "Osteomalacia" in the human subject. In this formidable malady, pain is a prominent symptom, and careful examination of the clinical histories of the reported cases shows, that in the majority of cases, pain, agonising in its characters, began in the lower extremities, and in some cases the patients became paraplegic. No doubt, in these cases the yielding vertebræ caused the spinal nerves to be compressed, for the lumbar vertebræ were softened, as proved at the autopsy, and the pain was always increased on movement.

That this condition of cord and vertebræ may be overlooked is easy to understand. So long as I followed the usual *post-mortem* routine and opened the neural canal from behind, I failed to observe the true "state of affairs," but when, on making transverse section of the column, leaving the cord *in situ*, the relative condition of bone and spinal marrow were observable and the condition recognised.

ÆTIOLOGY.

In the human subject there can be no doubt that many things, but no one thing in particular, conspire to produce Rickets. Poverty and hard living are no doubt factors in the case, bad hygienic conditions, unsuitable feeding, and especially depriving the child of the breast-milk of the mother, are powerful causes. Frequent pregnancies, with slight intervals, are predisposing if not actual causes of Rickets in the offspring.

There can be no doubt that the same list of causes operate in producing Rickets in animals. They are taken, many of them when quite young, from the mother, and fed on unsuitable diet; they suffer loss of exercise, and are exposed to the vicissitudes of an English climate.

That unsuitable diet plays a very important part in the production of

Rickets in children and in animals, may be illustrated by two cases. I saw a *post-mortem* on a boy aged five years, who died as rickety as it is possible to imagine a child. The boy's only desire was to be fed on sausages and bread, with gin to drink, such as his miserable parents had been accustomed to give him. That same day I made an examination of a young bear, eighteen months old, with rickety changes in every bone; it had been taken quite young from its mother, and brought up on board ship to eat boiled rice. The two cases were good examples of the vicious effects of improper food.

When a wild animal becomes a prisoner, it is in most cases impossible to provide the creature with that variety and quality of food which it obtains when in its wild state.

Not long ago some fine examples of the babirussa were presented to the Zoological Society; seven months later, a fine male died, with all the bones spongy and soft, as the monkeys' skeletons described in the earlier part of the paper.

Lataste's observations on the gerbilles show in the most conclusive manner that Rickets is a result of captivity, and the longer the animals remained in the captive state the earlier the offspring showed symptoms of Rickets. Gerbilles, born in the desert, then confined in cages, became rickety in two years; but those born in confinement succumbed to the disease in fifty-two days.

Principal Robertson, of the Royal Veterinary College, London, informs me that dogs are often subject to Rickets; and he considers that want of exercise, unsuitable food, and what is termed "in-and-in breeding," are powerful causes in producing the disease.

The case of the gerbilles is a very good example of in-and-in breeding. Then there is the question of frequent pregnancies, weakening the mother, and drawing on her store of lime salts.

A gentleman, who lived for eleven years on the West Coast of Africa, and still resides there, assured me that Rickets was unknown, and that after a woman is delivered of a child she is kept apart from her husband for one year.

Respecting the causation of osteomalacia in the human subject, most observers have pointed out the association of frequent pregnancies with this formidable disease, so with regard to the gerbilles, the females who were most prolific succumbed earliest to the affection.

General Conclusions.

The facts and deductions set forth in the preceding pages have been made from observations on a large number of animals of various species.

Since December, 1881, to the present time, more than two hundred monkeys have been examined *post mortem*. The proportion of Rickets in the last hundred Quadrumana was fifty per cent.; this means that half the animals kept in confinement in this country for any length of time die rickety.

Almost the same may be said of the Carnivora, particularly the smaller species, *e.g.*, cynictis, ichneumon, binturongs, etc. Bears are not exempt from the affection. Rodents suffer greatly, old and young. Instances of the disease occur in birds and in lizards, so that, zoologically, the disease is fairly well distributed.

Reviewing the facts broadly, it is obvious that the forms described as "Rickets of Infancy" and "Rickets of Puberty" are the same diseases, modified according to the normal physiological process in operation at the age at which the perturbation manifests itself—the abundance of material enabling one to set this question definitely at rest.

With regard to the form of the disease occurring at maturity, there can

be little doubt that this is the result of similar causes, the effects being also modified by the altered condition of the skeleton incident to the adult state, and as each of the three phases of life—infancy, puberty, and maturity—is characterised by peculiar skeletal modifications, so do the effects of disease declare themselves in a special manner coincident with the age of the subject.

These facts also go to show that in the human subject "Rickets," "Late Rickets," or "Juvenile Osteomalacia," and "Mollities ossium" are the result of malnutrition, the effects on the skeleton varying with the age of the patient, and though clinically they present different features, nevertheless pathologically they must be considered identical, inasmuch as the fundamental character in all three is perturbation of the physiological processes concerned in the formation, growth, and nutrition of the skeleton. The following table is constructed to show the leading pathological tendencies of the disease according to the age at which it occurs.

Table to indicate the Distribution of the various Lesions according to Age.

	INFANCY.	PUBERTY.	MATURITY.
Skull	Soft and somewhat thickened at the vault. Exterior may present a worm-eaten appearance. The base often presents tabetic patches.	Vault is thickened.	Softened generally and eroded.
Vertebræ	Spongy and soft, encroach on the neural canal, causing paraplegia.	Present bulgings at the discs and epiphysial plates. Paraplegia.	Soft, spongy, and vascular. Paraplegia.
Thorax	Deformed and beaded. Infractions of ribs.	Beaded. Infractions of ribs.	Nil.
Long bones ...	Soft, curved, with large epiphyses. Spongioid tissue reaches its maximum.	Fibrous tissue in a thin layer at the epiphysial line. Spongioid tissue in a minimum degree.	May be often soft and curved, or the compact tissue exceedingly thin and brittle.
Teeth	Temporary set, normal.	Permanent set late in erupting.	Fall out prematurely, due to absorption of the sockets.

Fœtal Cretinism.

The subject of Rickets cannot be passed over without some allusion to a disease which in many points seems to be closely allied to it, yet in other respects is so very different. On account of the resemblance it bears to Rachitis, it has been called "Fœtal Rickets" by some authors, but other pathologists refuse to regard it as such, and consider the affection as being of the nature of Cretinism.

Professor Eberth has written a monograph on the subject, entitled "Die Fœtale Rachitis und ihre Beziehungen zu dem Cretinismus, 1878," and describes a case which he had met with in a calf. Specimens have been investigated by Müller and Urtel. In this country examples of the disease, under the name of "Fœtal Cretins," have been shown at the Pathological Society by Dr. Barlow, Messrs. Shattock, Bowlby, and the writer (see vols. xxxii. and xxxv.).

The subject has been mentioned here, because the disease undoubtedly occurs in animals. In addition to Müller and Eberth's observations on calves, Shattock has drawn attention to a fœtal bitch puppy in the Teratological Series of the Royal College of Surgeons' Museum, London.

It seems to me that, as Rickets is so very frequent in animals, not only Quadrumana, Rodentia, and Carnivora, but it also occurs with tolerable frequency in horses, mules, lambs, etc., it may reasonably be expected that examples of these curious fœtuses ought to turn up now and then if the disease be really due to Rickets occurring *in utero*. So far as I have been able to observe at the Zoological Gardens, none of the young born there have exhibited this condition of the skeleton in the slightest degree, although the number of still-born animals is not by any means small. On the other hand, there are many points in the anatomy of the disease associating it with Cretinism, but there is not a sufficient number of cases on record to enable a true verdict to be given. This fact should stimulate those who have opportunities in this direction, to be on the look-out for cases occurring among mares, ewes, cows, etc., and to have them carefully dissected, described, and recorded in accessible places. Up to the present time I am unaware of any progressive case of intra-uterine Rickets having been observed. Until this be done there is not a tittle of evidence to warrant the "Rickety" origin of these singularly interesting malformed fœtuses of man and animals.

Bibliography.

1. *Catalogue of the Museum of the Royal College of Surgeons, London*, vol. ii., 1883, contains an account of the rickety skulls and skeletons of animals exhibited there.

2. *Veterinarian*, 1860. This contains Varnell's account of a peculiar disease of the osseous system in the horse.

3. *Journal de Zoologie*, tome iv., 1874,—Paul Gervais' paper, entitled "De l'hyperostose chez l'homme les animaux."

For a full account of *Pachyacanthus Suesii*, reference must be made to a paper by J. F. Brandt, published in the *Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg*, tome xx., 1873, entitled "Untersuchungen über die fossilen und subfossilen Cetaceen Europa's."

4. *Bulletin Mensuel de la Société Nationale d' Acclimatation de France* for July, 1883. Lataste's paper "On the Acclimatation, etc., d'un petit Rongeur."

5. *The Trans. Path. Soc., London*, vol. xi., 1859-60,—Dr. Harley's account of, and microscopic appearances found in, Mr. Varnell's case of a peculiar disease of the osseous system in the horse. Vol. xxxii., 1881,—Dr. Barlow and Mr. Shattock on "So-called Fœtal Rickets." Vol. xxxv., 1884,—Other

examples of "Sporadic Cretinism" (fœtal Rickets)? by Dr. Barlow, Mr. Bowlby, and myself. Vols. xxxiv. (1883) and xxxv. (1884) contain my papers on "Bone Diseases in Wild Animals."

6. Professor Eberth, *Die fœtale rachitisme, etc.*, Leipsig, 1878.

7. *Proceedings of Zoological Society*, 1845. Professor Percy "On the Management of Monkeys in Confinement."

8. *Path. Soc. Trans.*, 1881, vol. xxxii. Dr. Crisp's remarks on "Animal Rickets" in the Debate on Rickets.

9. *Med. and Chir. Soc. Trans.*, vol. xxvii., Mr. Solly,—"Bone Disease."

10. Otto, *Compendium of Human and Comparative Pathological Anatomy* (South's translation, 1831).

11. *Med. and Chir. Soc. Trans.*, vols. xvii. and xxvi. Mr. Shaw's "Observations on the Effects of Rickets on Head, Face, and Pelvis."

Those who wish for details concerning individual cases of Rickets in animals I must refer to my original papers in the *Trans. Path. Society*, vol. xxxiv. The forthcoming vol. xxxv. contains two papers on the subject, detailing a far wider experience of the disease. All the communications are illustrated by numerous woodcuts.

The *Proceedings of the Zoological Society* for March and April, 1884, contains full details of the disease as it occurs in Carnivora.

Several complete skeletons are exhibited in the Pathological Series of the Museum of the Royal College of Surgeons, and typical examples of the disease are preserved in the Museum of the Middlesex Hospital, and at Cambridge.

Perhaps one cannot do better than close this paper with a quotation from Otto's *Human and Comparative Pathological Anatomy* (South's translation, 1831). It runs as follows :—"As, however, man forms but one link in the chain of organic beings, so for the perfection of pathological anatomy nothing would operate more advantageously than the investigation of the diseased structure of other organic bodies, and particularly those of animals. As soon as we have collected a considerable number of such observations we may expect, in a general view of the vices of structure in organic bodies, to penetrate deeper into their nature and causes. Even now, whilst pathological anatomy, in comparison with most other medical sciences, is only in its infancy, its utility is traced in almost all the branches of medicine. It is the common and absolute source of all, but particularly of anatomy, physiology, and pathology."

ANTHRAX IN INDIA.

REPORT OF A COMMITTEE ASSEMBLED AT BANGALORE, ON 19TH FEBRUARY, 1884, BY ORDER OF HIS EXCELLENCY SIR FREDERICK ROBERTS, BART., V.C., G.C.B., COMMANDER-IN-CHIEF OF MADRAS, TO INQUIRE INTO THE RECENT OUTBREAK OF ANTHRAX AMONG THE GOVERNMENT HORSES AT BANGALORE.

President: Lieutenant-General PAYN, C.B., Commanding Bangalore Division.

Members: Inspecting Veterinary Surgeon F. G. SHAW, Madras Army; Veterinary Surgeon, First-class, W. S. ADAMS, A.V.D.; Veterinary Surgeon J. MILLS, A.V.D.; Veterinary Surgeon F. SMITH, A.V.D.

I.—Memorandum from Inspecting Veterinary Surgeon G. Evans, M.D., sent to the Committee for guidance.

A. The immediate cause of Anthrax is not now a matter of speculation, for nothing is better established in medical science than that the disease is directly due to the introduction into the blood of an organism of the vegetable kingdom known as the *Bacillus anthracis*. It has also been proved, over and over again, that this vegetable organism flourishes in a soil that has been under shallow water for some time and then exposed to the sun ; it can easily be artificially cultivated, and it is brought to the surface by earth-worms from the graves of animals that have died of the disease. These are some of the established facts which every intelligent committee will accept, and from them proceed to inquire how is this *bacillus* usually conveyed to the horses? In pursuing this investigation, the food, drink, air, and horse lines flooring should be considered.

B. I have already said that, while the disease is very common and fatal at Bangalore, it is almost, if not quite, unknown at the Remount Depôt, Hosúr, and at Bellary. The Committee should make a special inquiry into the cause which may account for this difference.

C. If the Committee can find, with probable certainty, the most common mode by which the virus is conveyed to the horses, they should next consider the best means of averting it, and recommend whatever change of diet or sanitary conditions which they may deem most efficient and practicable.

Report of the Committee.

1. Accepting the recognised etiology of the disease as an established fact, the Committee now proceed to weigh the evidence before them—evidence collected on the spot by the Committee, from veterinary officers in the Presidency, and from the written opinions of eminent authorities.

2. The three points for investigation are taken in the order given in the Adjutant-General's memorandum.

A.—How the bacillus is conveyed into the organism.

3. On this point opinions are divided. There are advocates for each of the three theories--air, food, and water.

Air.—Can the air convey the poison?

Nageli asserts that fungi can only pass into the air when their nutrient liquids dry up. Soyka has shown that gentle air currents can carry them out of liquids. Buchner, on the other hand, asserts that strong currents of air are insufficient to sweep bacteria from a liquid, and that even in the case of dried-up masses containing fungi, that these can only be liberated if the surface be broken. When it is considered that the weight of a small moist bacterium is estimated at the *ten thousandth millionth of a milligramme*, there is no difficulty in accepting the fact that they may be carried about by the faintest breath of air.

4. The weight of opinion is with Buchner, which the Committee endorse ; the following statistics from the Veterinary Report of this Army, dated 26th July, 1883, No. 439 (Military), showing the number of fatal cases from 1868 to 1883, inclusive, give strong support to this theory, as may be seen on referring to the subjoined table :—

Stations.	Total cases of Anthrax in the years ending March																—
	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	
Saugor	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..
Kamptee	..	..	..	..	3	..	4	1	2	..	..	..	..	..	10	5	25
Secunderabad	38	10	..	..	2	..	2	..	..	..	..	..	..	..	5	..	57
Bellary	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Bangalore	48	45	11	7	5	3	4	47	17	2	..	1	..	..	1	15	206
Trichinopoly	..	..	..	..	..	..	7	6	..	..	..	..	..	..	..	..	13
The Mount	9	..	..	1	12	12	12	14	2	4	..	..	1	2	2	2	73
Madras	1	..	..	..	..	2	..	1	..	..	1	3	..	..	..	..	8
Thayetmyo	..	..	..	..	..	23	3	..	..	5	4	..	..	..	..	..	35
Total	96	55	11	9	22	40	32	69	21	11	5	6	1	2	18	22	420

On referring to the years 1875-76, we find that ninety fatal cases of Anthrax occurred in the Presidency, during which time (the famine years) the rainfall was below half average, when the soil was for the most part in that condition mentioned by Buchner as favourable to air poisoning.

Bangalore and the Mount suffered most during these years, which lends strength to this theory; but, on the other hand, we find that Bellary, though placed under identical conditions, had not a single case of Anthrax. However, in 1876 occurred a virulent case at the Remount Depôt (Hosúr).

5. The Committee can only conclude from this that the poison may be conveyed by dry air; particularly so when charged with dust, which is capable of being conveyed to great distances. Veterinary Surgeon Going also informs us that his cases at Bangalore, during these years, were principally those affecting the respiratory organs, as was that which occurred at Hosúr, evidence presumptive of air infection.

6. We have so far only considered the air in a dry state, and have now to deal with moist air.

7. Evaporation is constantly present in India. Heat and moisture are necessary for the development of the spores which produce the disease, and these are carried upwards by the process of evaporation and disseminated.

Nageli says that the condensed watery vapour of the atmosphere maintains the buoyancy of bacteria, and that friction likewise retards their fall. It is fully recognised that the bacilli of malaria are carried up into the air from marshes, and are similarly disseminated. We therefore conclude that moist air from an infected spot can convey the disease, and this is accepted at the Cape as the ruling or common cause of horse sickness (Anthrax).

8. Inspecting Veterinary Surgeon Lambert and Veterinary Surgeon Healy both note this condition of atmosphere as productive of the disease in that country, and it is worthy of remark that nearly all the opinions collected from veterinary surgeons in the Presidency note the damp, moist, or steamy condition of the atmosphere during the period of outbreak; these conditions were present during the outbreak in the cavalry brigade camp at Krishnarajpuram in January, 1884.

9. It would appear from the local inquiries made by Messrs. Adams and Smith (at Bangalore) that three-fourths of the cases which they were able to collect from available records occurred in the latter half of the year, *i.e.*, from July to December, and from the statistical report of this and other stations, it would likewise appear more prevalent in these monsoon months

and while the land remained damp after the rains. It must be borne in mind that the whole of the stations of this presidency, with exception of Kamptee and Saugor, are visited by both monsoons in a greater or lesser degree.

10. We have now to consider the probability of the air, under the conditions noted above, being the origin of the disease in Bangalore. There is strong presumptive evidence that the outbreak in this station in December last was attributable to atmospheric cause. In this outbreak the virus would not have been conveyed in its dry state, as at this time the surrounding country would have been still moist from the recent monsoon, the tanks full, and wet lands covered with water ; but from the great evaporation taking place under this condition, there would be ample moisture in the air to hold in suspension the germs of *bacillus anthracis* arising from any tainted spot in their most infective state. The outbreak was not localised, but attacked simultaneously (or within twenty-four hours) the horses of I Battery, 3rd Brigade, Royal Artillery, S Battery, 1st Brigade, Royal Artillery, and the elephants of the transport, pointing conclusively to one and the same exciting cause. These lines were situated in a direct line with the prevailing wind (E.N.E.) That the animals were not absolutely simultaneously attacked may be accounted for by the probability of the period of incubation being longer or shorter according to the constitution of the animal affected. From what infected spot the atmosphere derived the spores it is, of course, impossible to trace.

11. We have equally strong reasons to adduce in support of both conditions of the atmosphere—wet and dry—being favourable to the development of the disease ; as, for instance, the heavy mortality during the famine years, and the almost total absence (three cases) of the disease in the wet years that followed, 1877, 1878, 1879.

12. From the above, it would appear that there are atmospheric conditions that will convey the virus in both wet and dry weather, and apparently under identical conditions in other years the disease does not occur. This would appear to be particularly the case as shown in the table, from which it would seem that Anthrax, like Cholera, visits us in cycles of years, the laws ruling which yet remain a mystery to medical science.

13. WATER.—There can be no doubt that water is a means of conveying the disease, and it may be contaminated by all or either of the following causes :—

1st.—Direct pollution by diseased animals.
2nd.—Surface drainage from infected country.
3rd.—Conveyance into it of spores by atmosphere.

Of these three probable causes, we think direct pollution to be the most common.

14. The Government horses at Bangalore are exceptionally treated with regard to their water-supply, for with the exception of the 1st Light Cavalry, they are all given the Ulsoor tank *filtered* water in the same state as supplied to the troops. However, this water has been generally suspected by the medical authorities as a source of Typhoid Fever, and there is no doubt that it is open to pollution by cattle, etc.

15. That coarse filtration does not rid the water of bacilli is well known ; but were the water a source, we would expect to hear of cases of Anthrax among the troops, as the human subject is well known to be liable to the disease.

16. It should also be remembered that the water, after it has reached the lines, is open to pollution, either in the reservoir, as per cause 3, or in the watering troughs, as referred to in para. 38 of the Local Investigation Report.

In the case of the water of the 1st Light Cavalry, which is obtained from a tank close to their lines, pollution is more likely to occur from the amount of surface drainage, its proximity to the public road, and from dust and rubbish which is conveyed into it by the wind.

17. The outbreak of the disease in the cavalry brigade camp at Krishnarajpuram would almost point to the water being the source of infection, as is shown in para. 23 of the Local Investigation Report. The horses of E Battery, B Brigade, Royal Horse Artillery, 12th Royal Lancers, and 1st Light Cavalry (in each of which there were cases of Anthrax), were watered from a certain tank, while the horses of the 2nd Light Cavalry, which were watered from another source, escaped. It should be mentioned, however, that the Mysore Silladar horses were watered from the first-mentioned tank, but were not attacked.

18. We would here draw attention to the fact that the first case attacked was a horse of E Battery, B Brigade, Royal Horse Artillery, which had only arrived in camp from Bangalore three days previously, and it is quite possible he had the germs of the disease in him on arrival, for we find that he had been picketted in close proximity to a shed in which three horses had died from Anthrax during the previous two years.

19. Though attaching due weight to the outbreak at the cavalry brigade camp at Krishnarajpuram, and the probability of infection from the tank water, we nevertheless do not think that the disease can be traced to that source, but it is quite possible that the horses may have brought the infection with them from cantonment, where it had raged a few weeks previously.

20. After due reflection, we do not think that the water has been responsible for the disease as it occurs at Bangalore.

21. SOILS.—The soil is undoubtedly, and, on the best authorities, the chief habitat of bacillus germs. Koch shows that surface soils and moulds are extraordinarily rich in bacterial germs, but as we go deeper, the micro-organisms diminish rapidly. That at the depth of a metre (3 feet $3\frac{3}{8}$ inch) they seem entirely absent. This point is generally accepted.

22. Given therefore the presence of *bacillus anthracis* spores in the soil, we find that certain conditions are necessary for their development. These conditions are a proper temperature, the presence of organic and inorganic matter, and a free supply of oxygen. The best temperature for their development is 77° to 86° F. Formation of spores does not occur below 59° F., and only with great difficulty below 64·5° F. The temperature of soils varies at different seasons of the year, and at different depths. We have no accurate records of the temperature of Indian soils, though experiments have been made on this point at Calcutta.

23. Koch states that no spores are found in the bodies of animals buried more than a metre deep, for the reason that at that depth the temperature for the development of spores is not high enough, and there is an absence of a free supply of oxygen.

24. The organic constituents of soil necessary to the development of *bacillus anthracis* are derived from animal and vegetable matter, such as dead moist grasses, plants containing starch, etc., which afford the necessary carbon and nitrogen for the nutrition of these bodies.

25. The inorganic substances are derived from soils containing sulphur, phosphorus, magnesium, and potassium.

26. The injurious effects of sulphates in hastening organic decomposition have been noticed, while the presence of lime in the sub-soil is a necessary condition for the development of these spores. All the conditions enumerated above we find present in the cantonment and surrounding country of Bangalore (as also, indeed, it must be acknowledged, in most parts of India), and we have to consider how the soil and its poisoned products may be conveyed

to the horses. This is undoubtedly through the medium of the grass, air, or water—one or all. The former we shall deal fully with under its proper heading, the air and water we have already noticed.

27. Before closing the subject of soils, we feel bound to mention the fallacious "earth-worm" theory of Pasteur, which is now clearly demonstrated by Koch to be "unnecessary and erroneous."

28. FOODS.—We are fully alive to the importance of the consideration of this mode of conveyance of the disease, and under this heading we have to consider a variety of media by which the virus may be conveyed to animals in grass and other forage.

29. *Grain.*—We might almost dismiss this item at once, because it is fair to presume that the grain food, as supplied to the horses, does not primarily contain the spores, or, if so, the process of boiling and subsequent steaming would certainly render them inert.

30. The Transport bullocks at Bangalore, we understand, are fed on *cooltee*, which is soaked in cold water, but Anthrax has not appeared among them.

31. *Grass.*—We have abundance of proof that grass can convey the disease, for it is a well-known fact that grass impregnated in any way with the spores of Anthrax will, on introduction into the system, give rise to the disease. We have experimental proof that this is correct, and we know that certain grasses and soils form suitable media for the growth of these organisms.

32. We are told that sandy or silicious matter in the grass, by causing wounds in the digestive track or injuries within the mouth, would render infection more liable by permitting the entrance of the spores of the *bacillus anthracis* into the circulation, and we are also informed of experiments which have been made to prove that, unless there is a broken mucous surface, infection cannot result. We, however, do not consider that a broken surface is absolutely necessary for infection, but that the open mouths of the many hundreds of intestinal glands and follicles will alone afford a ready entrance of the spores into the circulation.

33. From the mode of collecting the grass, and the localities from which it is brought, it would seem at first sight to be not only a probable, but a sure source of infection, for we gather that Anthrax is scarcely ever absent from among the cattle in the district, and the surrounding country is infected by the carcasses of horses, bullocks, etc., that have died for many years past, thus affording numerous *foci* for its spread.

34. There are other means by which grass may be infected; for example, superficial burial of anthracoid carcasses, and the generation of spores which are taken up in the grass roots and earth adhering thereto; the flooding of lands carry along with it the spores or rods from infected places; the pollution of grass and soil from the excreta of animals suffering from the disease, or from manure carted from cantonment, or from cattle-pens where the disease may have existed; grass washed in infected pools, and grass cut on lands on which the spores may have been deposited by the air.

35. Grass cut from below the surface, we think, would be more likely to convey the disease than that cut above, although that growing above the soil is by no means free from infection, as we shall show later on when dealing with hay.

36. While placing all due weight on surface contamination from diseased carcasses having been thrown on the soil, it is very important to notice, tending to detract from this source of infection, that in Secunderabad in the years 1868 and 1869, forty-eight carcasses were thrown on the soil, *and yet in the succeeding twelve years only four cases of the disease occurred.* We notice the same thing at Bangalore, for in the years 1868, 1869, 1870, 104

carcasses were similarly disposed of, and yet in the succeeding four years only nineteen deaths occurred. We should naturally have expected from this surface pollution an increase, instead of a decrease, in the number of cases. The same remarks apply to other stations.

37. *Hay, rumna grass, ragi-straw, paddy-straw, cholum, etc.*

38. Taken all together, these are less liable to sources of infection and pollution than grass-cutters' grass, in that they are produced on cultivated and higher lands (excepting paddy-straw). In Bangalore and Ooscotta, hay is largely cultivated as an industry, and finds a ready market in the Commissariat and private stables. Bangalore may be said to possess advantages over other stations in this respect.

39. Hay at first sight would appear to be above suspicion, but we have evidence to the contrary; for, in the *British Medical Journal* of 4th September, 1880, Professor Law writes :—

"I have further known pastures, in which Anthrax had been developed for the first time in the memory of the inhabitants, maintain their infecting qualities for six years in succession, and to yield hay which continued to infect animals when fed to them at a distance from such pastures."

40. As a probable source of hay infection, we would note that the manuring of land with material from infected places would undoubtedly convey the disease.

41. The Committee would now notice a very important fact in connection with the bacillus producing Anthrax.

It has been shown, by careful observances, that the *bacillus anthracis* may be cultivated from the *bacillus subtilis* found in hay infusions; that the one under certain circumstances may be converted into the other. This theory, although strongly opposed, is gaining ground with reference to other specific diseases; but it is now generally believed that a transformation may occur in germs, and that what was at one time a non-disease-producing germ may, under certain circumstances, become a virulent organism.

42. The *bacillus anthracis* has been obtained from the *bacillus subtilis* which is found in hay, and in a recent number of the *Nineteenth Century* there is an article by Dr. Carpenter, in which we find the following remarkable paragraph :—

"It is a fact of great significance that the malignant *bacillus anthracis* of *charbon* does not differ morphologically in any important character from the innocent *bacillus subtilis* of hay infusion, and although it has not yet been certainly shown that any method of treatment can give to the latter the potency of the former, yet it seems not improbable that such may be the case. With Dr. William Roberts, I see no more difficulty in believing that the *bacillus anthracis* is a 'sport' from the *bacillus subtilis*, than in believing (as all botanists tell us) that the bitter almond is a 'sport' from the sweet almond—the one a bland and innocuous fruit, and the other containing the elements of a noxious poison."

43. In support of the above, we summarise the portion of a leader which appeared in a recent number of the *Medical Times and Gazette.*

As far as our means can demonstrate, it has been proved that the *bacillus anthracis* of Splenic Fever is the same organism as the *bacillus subtilis* which flourishes in vegetable putrefactions. A series of cultivations made by Buchner, in which the condition of pabulum, oxygen supply, and temperature was gradually modified, converted the *bacillus anthracis* into the harmless *bacillus subtilis*, and the *reverse process has been effected.* Koch refuses to admit these conclusions, chiefly on theoretical grounds.

In these days of Darwinism, it needs no preface to prove the proposition that all parasitic organisms are necessarily derived from closely-allied non-parasitic forefathers. The adaption must have been a gradual one, and

there can be no doubt that disease-producing *bacteria* have been, at some time or other, derived from non-disease-producing *bacteria*.

Moreover, it seems probable that disease-producing *bacteria* have an intermediate phase of existence external to their host.

"It cannot be shown, for instance in the case of *bacteria anthracis*, that the bacteria are passed direct from host to host; apparently they exist widely spread on the surface of the earth. In this widely-spread non-parasitic condition it is probable they are harmless as *bacillus subtilis*, that only here and there, from time to time, when definite conditions occur, such, for instance, as the admixture of animal fluids, blood, etc., with the most usual constituents of the soil, do they gradually, in those particular spots, undergo modification and become adapted to take the last step and enter on a parasitic and disease-producing phase of activity. This offers an explanation not afforded by the fixity of bacteria—(1st) the importance of organic refuse in breeding disease; (2nd) of the apparently spontaneous outbreak of zymotic disease (really the acquirement of parasitic adaption by species of bacteria present generally in a harmless state); (3rd) of the paradox that, according to the fixity theory, millions of these pathogenic bacteria must everywhere be diffused in a state ready for active infection, and yet men and animals are not habitually attacked by them, but only at intervals of time and place so as to cause what are known as epidemics."

The intermediary vehicle in Anthrax seem to us the important point to determine, and without carrying this theory to extremes, it seems probable that pathogenic bacteria may have a free living harmless phase of existence.

44. *Now with such authorities as these, we may simply ask the question, whether the bacillus subtilis found in grass can, through becoming converted, give our horses Anthrax? This is of vital importance, for if so, neither preserved lands nor carefully gathered hay will prevent the disease invading us.*

45. The Committee is not prepared to say what the changes are that are necessary for the conversion of the *hay bacillus* into the *Anthrax bacillus*, but they would note as a not improbable cause the fermentation which occurs in a wet bundle of grass.

46. *Rumna grasses.*—These we may dismiss in a few words, as far as Bangalore is concerned, for they are little used owing to the better kind of hay cultivated.

47. *Ragi-straw.*—This we do not look upon as a source of infection *per se*, but only liable to become so by direct pollution; especially would this be so whilst being thrashed by bullocks.

48. *Paddy or rice straw.*—The principal use of this is amongst Commissariat cattle as a fodder, and to troop horses as bedding. Among the Government bullocks we have not traced any disease, though the straw is a product of wet lands, which we know to be favourable to the development of *bacillus anthracis*.

49. *Cholum.*—This is a cattle and elephant fodder, and unlikely, from its height from the ground and cultivation, to be infected; yet it is noteworthy that the elephants of the Transport and horses of I Battery, 3rd Brigade, Royal Artillery, which were severely attacked during the last outbreak at Bangalore, were receiving this as a supplementary fodder, but the horses of S Battery, 1st Brigade, Royal Artillery, which did not partake of the cholum, were simultaneously attacked with the disease. From the above, we argue that the cholum was not the cause of this outbreak.

50. *Tank grass, sedge.*—This is exclusively an elephant fodder. The Transport elephants were thirteen days in Bangalore before they were attacked, during which time they had not received any tank or sedge grass which appears to have been their principal fodder at Toomgoondall, the

elephant depôt. Theoretically, we should look to this fodder as a most probable vehicle for the conveyance of the bacillus or its spores, but a fairly long period had elapsed between the time it was used as a fodder and the attack, and since their return to the depôt, and to this grass, no fresh cases have occurred. We fail then to attribute the outbreak to this source.

51. *Lucerne.*—This is an exceptional food supply to Government horses, but it is cultivated, to a limited extent, by some regiments and batteries in certain stations as a supplementary or sick diet; we mention it here as bearing on the question of probable infection, for we find there is a lucerne garden kept up by the E Battery, B Brigade, Royal Horse Artillery, at Bangalore, which is on the site of the old Native Horse Artillery horse lines, in which lines a very virulent outbreak of Anthrax occurred in 1869. These lines were left vacant for five years, and the garden was started ten years ago, we have thus an interval of fifteen years from the year 1869 to the recent outbreaks. From the length of time that has elapsed and from the fact that the fodder is cut a few inches above the ground, we are not inclined to look on it, at this distant date, as a source of infection, but we have no data to guide us in our opinion as to the length of time land may retain its infective properties. We would here draw attention to the fact that the horses of the 12th Lancers do not get lucerne, and this regiment has suffered severely with Anthrax since its arrival at Bangalore.

52. *Summary on the above.*—So much weight is attached to grass as a means of conveying the disease, that we think we cannot do better than give the evidence for and against this agent.

In favour of grass we have the important fact that the disease has been traced directly to this agency. We know that by whatever means spores are carried into grass or fodder, that such fodder is likely to give the disease. We reasonably suspect grass from the fact that it is cut anywhere, subject to all pollution both before and after gathering, and that direct experimental investigation has proved all these points beyond a shadow of doubt. On the other hand, we have certain evidence which tends to weaken the grass theory; for instance, we have detailed the important fact that, after large outbreaks in previous years, the disease was practically absent for some years following; whereas, if grass and soil pollution, which did occur, was a prolific source, the disease, instead of decreasing, would have multiplied itself every year on account of there being more centres of infection. Again, there are other stations in India where the grass is gathered just as in Bangalore, but in which Anthrax seldom appears. Madras grass is for the most part cut at Pallávaram, the Mount grass from the same place. Yet one suffers severely, and the other (according to returns) but mildly. However, the most telling evidence is the important fact that the hack-gharry horses at Bangalore, which receive grass cut from anywhere, soaked in any pool, worse in quality than that supplied to troops, do not suffer from the disease Of this we are assured—*vide* paras. 77-83 of "Local Investigation Report."

This startling fact carries the more weight when we consider that the germs of this disease are spread over the surrounding country. The civil horses in Bangalore exist in greater numbers than the military; they receive worse grass than Government horses, and yet the disease is rarely known amongst them. We could have no stronger evidence than this against the grass, for here we have a number of animals placed under identical conditions as regards climate, soil, and food; with one the greatest care is exercised with respect to the grass; they are well-fed, clothed, and cared for, and yet the disease is practically never absent from amongst them; with the other, which receive the greatest filth as grass, are under-fed, over-worked, and often living in the dirtiest of stables, we find that the disease is

practically unknown. Neither air, soil, nor surroundings can be urged in favour of this comparative immunity, for all are of the worst description.

The following extract from an article published in the *Nineteenth Century* by Dr. Carpenter, on the *Germ Theory of Disease*, may offer a possible explanation of the immunity of the hack-gharry horses in Bangalore from Anthrax :—

"All the predisposing causes of epidemic diseases may be generalised under one expression, the accumulation of decomposing nitrogenous matter in the blood, either from its introduction from without (foul air, impure water, or putrescent food), or through its excessive generation within the body, as by an unusual waste of tissue, or by an obstructed elimination of the normal waste, such as results from bad ventilation or the misuse of alcoholic liquors."

"Zymotic poisons which have no action on pure blood will, by seizing on this *appropriate pabulum*, increase and multiply in it."

The hack-gharry horses, from their regular work and short feed, have at no time any excess of nitrogenous material in the blood, in fact the amount is barely sufficient for the expenditure in the work exacted from them ; thus the blood is never in that state described as an *appropriate pabulum*.

Anthrax is also very rare among horses in private stables in Bangalore. These horses are regularly worked, although well fed, and the equilibrium of supply and waste is nearly maintained.

Prolonged and weakening exertion in animals not in "condition" for such work, would necessarily cause an unusual *waste of tissue*, and throw an excessive amount of nitrogenous matter into the blood. This may possibly account for the mortality from Anthrax, which was so marked after exertion, amongst the horses of the 1st Madras Light Cavalry during the Camp of Exercise.

53. STABLES, HORSE LINES, ETC.—By a reference to para. 21, under the head of "Soils," we find that all the conditions there noted as being favourable to the growth of *bacillus anthracis* are present in stables and horse lines.

That the source of infection is sometimes in the horse lines we have strong presumptive evidence. The case of the mortality in the shed of the E Battery, B Brigade, Royal Horse Artillery horse lines (*vide* para. 45 of local report) ; also the extraordinary mortality in No. 1 sub-division of the same battery (*vide* para. 41 *idem*), and the instance of cases occurring in horses occupying the same picket on two consecutive years (para. 46), and the localised mortality in the A troop, 12th Royal Lancers, all point to some local source of infection.

54. That this does not always exist we have abundant evidence, of which nothing could be stronger than the fact of the 16th Lancers having been severely affected during the first two years of their occupying quite new troop stables (para. 5) ; but we must here note that one fatal case occurred in this regiment the month prior to occupying the new stables. It will also be necessary to point out that at this time the disease was by no means localised in that regiment, or even in Bangalore, but it was prevalent at the same time in Secunderabad, and to a lesser extent at Kamptee and at Hosúr.

The 1st Light Cavalry had occupied new open lines for only twelve months, when they were attacked, and the same regiment had a large mortality from Anthrax lately, whilst daily on the move at the Camp of Exercise at Krishnarajpuram.

55. DISPOSAL OF MANURE.—This is always a difficulty in stable management. It is customary at Bangalore to dispose of the manure to contractors who cart it away at frequent intervals ; at the time the lines were visited there

was no accumulation, but we find there is a place for general deposit of stable manure and barrack sweepings situated about 400 yards south-west of the Field Battery horse lines, in which lines the horses suffered heavily during the recent outbreak. We cannot of course overlook the fact that manure may be a source of infection, and we would draw attention to Mr. Gunn's remarks touching this subject.

We notice also in a very recent article in the *Medical Times and Gazette* the importance of organic refuse in breeding disease; this is referred to under heading *Hay*.

56. Biting and Stinging Insects.—These may be, and probably are a direct mode of infection by inoculation.

57. Horns, Hides, etc.—Bangalore is a large centre of trade where such are collected and forwarded to the coast for export. It is quite possible that this industry may be a means of introducing the disease, but we have no direct evidence to lead us to this conclusion.

58. Slaughter Cattle.—We find from inquiry that there are approximately about 100 beasts, and a correspondingly large number of sheep, daily slaughtered in the slaughter-houses in Bangalore, but there does not appear to be any professional supervision or inspection either before or after slaughter.

Considering the amount of disease (*vide* Cattle Inspectors' Reports) shown to exist among the cattle in the neighbourhood and surrounding country, we cannot too strongly urge the necessity for proper professional supervision with a view to check the introduction of diseased animals into cantonment; to render this effectual, it would be necessary to inspect all animals for slaughter at a given place without the limit of Bangalore.

59. With regard to the disposal of offal, the question is an urgent one, as in case of disease there could be no more effectual means of distributing infection than by this agency. We lay great stress on this point, for we find that the offal from the Government slaughter-house is deposited within a mile south-east of the Agram barracks, and though it may be argued that Anthrax has not been produced in man, and that consequently the carcases from which the offal was derived could not have been anthracoid, yet this immunity is probably due to the fact of the meat having been cooked. As a prophylactic measure, we strongly advise the destruction by fire of all offal, which should not be utilised as manure, as is at present the case.

60. With reference to the last paragraph, we would draw special attention to the extract from the *Medical Times and Gazette* under the heading *Hay*, which clearly shows the action of decomposing organic matter in the production of zymotic diseases.

B.—The Comparative Immunity of Bellary and Hosur.

The following papers on the subject by Messrs. Adams and Shaw, and the Cattle Disease Inspectors' reports are appended.

Veterinary Surgeon Adams states:—

The disease (Anthrax) is not entirely unknown at the Remount depôt. There was one sporadic case in the year 1876, and a second in 1879. Mr. Shaw informs me that he is positive that, during his residence at the depôt, there were several cases of Anthrax, but they were not recognised as such.

2. It is difficult to attribute this comparative immunity amongst the horses to any difference in the stable management. I have now seen all the batteries and regiments, as well as the Transport cattle and Silladar horse at Bangalore; I am therefore able to compare the systems.

3. At the Remount depôt, when the purchasing is finished, the whole of the stables are filled, and the horses in excess of the number of stalls are

necessarily picketted outside, on open pickets. Up to last year, when the fresh horses were landed earlier, there has always been a period between the issue of remounts to the service and the arrival of fresh horses; the pickets and the majority of the stalls were then vacant; this gave ample time for cleansing and repairing. The outside pickets were often not occupied for more than six months of the year. Although there have at times been large numbers of horses at the depôt, the lines are so spacious, and each set of lines so widely separated, that there is no crowding. The depôt surroundings are very clean, the paddocks, etc., being exclusively used for the cultivation of forage.

4. The stalls are made of gravel and clay in the proportion of one part of clay to two of gravel; this, after being well wetted and rammed down, is tamped till it is perfectly dry. Flooring thus made is quite impervious, and if made with care, will not break up. This system has only been introduced during the past few years, prior to which the stalls were made with the best gravel, but they did not stand long and needed constant repair. Each stable has a urine drain running in front of the stalls, which is flushed and swept twice daily, so that there is no standing of urine in or about the stalls.

5. The system of grass-supply has been in vogue for a great number of years. The forage ration is mixed, and varies according to the supply procurable.

There is no establishment of grass-cutters, but contractors agree to supply the best grass procurable for a certain price and in quantities as required.

This system has great advantages; the first is that horses are ensured a full ration of the best grass; secondly, that as villagers usually supply the contractor, the grass is generally obtained from cultivated land, and not scraped up from waste lands and nullahs, to which the regimental grass-cutters are driven.

Since the number of horses at the depôt has been reduced during the greater part of the year, the entire grass-supply is obtained from lands within the depôt limits.

6. Hay is grown on the paddocks of the depôt, and is issued in no fixed quantity, but according to the quantity and quality of the other forage.

A proportion of green lucerne is also issued with the daily ration, the amount depending on the season. Chaff cut either from oat hay or from dried lucerne is mixed with the feed.

7. The water is obtained from several wells within the depôt limits, and is of excellent quality.

8. It has always been the endeavour to keep the depôt as free as possible from intrusion of cattle, ponies, etc., and at present special attention is being paid to this point.

9. That Anthrax often prevails amongst the cattle in the neighbourhood of the depôt I know from personal observation; a severe outbreak occurred in 1879, and a case occurred in a calf absolutely born in the depôt and never out of it. If, therefore, we are to look to the grass as a probable source of infection, the horses at the Remount depôt would appear to be similarly liable, but perhaps to a less extent, for the reasons above mentioned.

10. The climate of Hosúr is very much the same as Bangalore, for it is on the Mysore plateau and within a few feet of the same level above the sea; it is, however, nearer the ghâts, and there is not so much vegetation at the depôt as in Bangalore. The meteorological conditions would appear to be about the same, for the two places are affected alike by the same monsoons, and I believe the average annual rainfall is about the same, as are likewise the geological features of the country.

(Signed) W. S. ADAMS,
Veterinary Surgeon, 1st Class.

Inspecting Veterinary Surgeon Shaw states:—

With reference to para. 1 of Mr. Adams' remarks regarding the comparative immunity of Hosúr to attacks of Anthrax, I can only draw on my memory in support of what he says when quoting me.

2. Shortly preceding the outbreak of Anthrax among the horses of the 16th Lancers in 1868, I had two deaths in the Remount depôt, and as they agreed in *post-mortem* lesions and symptoms with those of the 16th Lancers (described to me in a letter from the late Mr. Richardson, the veterinary surgeon of that regiment, asking me to assist in a diagnosis of the disease), it occurred to me it was identical with what I had seen at Umballa in the 9th Lancers and Native Cavalry horses at that station in 1851, and known as "Loodiannah Disease" or "Fever." Further inquiry on the part of Mr. Richardson led him to identify the disease as such, and he changed the name from "Epizootic Fever" to "Loodiannah" Fever, and since by other veterinary surgeons to "Malignant Fever." Notwithstanding the attention Mr. Richardson bestowed on the subject, and inviting inquiry from the profession generally through the means of our (then) only journal, the true nature of the disease was not fixed or known as Anthrax among us until 1871-72, and its correct etiology some years later.

3. Here, then, we arrive at the identification of Loodiannah as Anthrax.

4. I have purposely digressed to show how we have so long groped in the dark.

On the continent of Europe it has long since been known for its specific character. In Asiatic countries it has been known as a form of plague for centuries. In the British Isles we have it (though to a lesser extent than on the continent) under various names in the different animals, such as "quarter-ill" or "evil," "braxy," and carbuncular Erysipelas, but we were not taught to accept its specific nature or true type, as the French and Italians appear to have done under the names of "Charbon" and "Typhus Charbon" till later years.

5. Now we are wise after the event, and I can hark back in memory to at least a score of cases which came under my notice at Hosúr among the Government horses, extending over a period of about eighteen years' service there, never as an epizootic but sporadic. It cannot, therefore, be said of Hosúr that it possesses any special immunity. I know it to have raged as an epizootic in a village about thirteen miles from the depôt, when the cattle died in hundreds. A few *post-mortem* examinations made at the time revealed all the lesions peculiar to the disease, but I could only name it then as "Cattle Plague."

6. The Cattle Inspectors report that Anthrax does exist at Hosúr, and I cannot but think that the statement about its comparative immunity has no foundation in fact. Mr. Adams, in his remarks, has fully entered into the system of stable management at the reserve depôt, which is very much the same in practice as it was in my day, and as near as possible identical with that among Government horses at Bangalore, with, perhaps, a little more artificial green fodder, lucerne, guinea grass, etc.

7. I may remark, however, that the system of watering the horses differed during the early part of my residence at Hosúr, when it was the practice to water the horses from tanks during all seasons of the year, and it is quite possible this may account for my having more cases than Mr. Adams has had.

8. The flooring of the stalls at Hosúr is better and harder than those at Bangalore, and I think worthy of being adopted throughout the Presidency. With the above exception, and, perhaps, a trifle more hay forage, supplemented with grass cut from their own paddocks, I see no difference in soil, climate, grasses, and general surroundings to Bangalore, from which it is distant in a direct line about eighteen miles.

9. The grass contracted for, if in any way superior to the Bangalore grass, is only so owing to there being fewer horses and greater selection at Hosúr, where there are, roughly speaking, about 500 horses ; at Bangalore about 4,000.

10. Bangalore is a centre of trade, much of which is carried on by bullock carts of the country. Hides, horns, etc., are collected and despatched to Madras by rail ; the live-stock trade for slaughter to supply troops and population of so large a town would, of course, be a means or channel for importation of the disease—points, it must be admitted, sufficiently cogent to account for Bangalore being more open to infection than Hosúr.

(Signed) F. G. SHAW,
Inspecting Veterinary Surgeon, Madras Army.

In considering the difference which exists between Bellary, Bangalore, and Hosúr, we must take into account—

1st.—Climate.	4th.—Forage supply.
2nd.—Soil.	5th.—Water.
3rd.—General surroundings.	6th.—General health of the horses.

1st.—Bellary is hotter, drier, and at a lower sea-level than the other two stations, and the climate more equable throughout the year.

2nd.—The soil is chiefly "black cotton" (regar) with a substratum of lime, and is impregnated with salines, among which is chloride of sodium (common salt).

3rd.—From the Cattle Inspectors' report it would appear that Anthrax is very rare among cattle, and they could only trace two cases in the vicinity of the cantonment within the last three years. This fact is borne out in the official agricultural returns for this district, and we find a corresponding clear bill of health among the Government horses—one death (from Anthrax) in thirteen years.

4th.—The grass is obtained in the usual manner, and at certain seasons of the year (rains) a good supply of *huriali* can be obtained, but during the hot and dry months a coarser kind of grass is brought in from the Koppah mountains. The only conclusion we can draw is that rumna grass is safer feeding than grass cut in low lands below the surface. The soil of Bellary is impregnated with salines, among which is chloride of sodium or common salt, and this possibly renders it an unsuitable habitat for the development of bacilli.

5th.—The water in most wells is brackish, and salt is found generally in the dry beds of tanks.

6th.—The general health of the horses at this station points to some geological or meteorological (possibly both) condition in their favour. Hosúr and Bangalore are (with respect to climate, soil, prevalence of disease among animals in surrounding villages) identical as regards conditions for the spread of the disease ; but the surroundings of the Remount depôt are cleaner, little or no trade, more open, horses not so numerous and crowded, a better supply of grass, and the water unimpeachable. These are the only differences which can possibly account for the fewer cases at the Remount depôt at Hosúr.

C.—SANITARY AND PROPHYLACTIC.

At Bangalore we have four conditions of horse lines : 1st, stables for British cavalry with ample superficial and cubic space ; 2nd, a battery of horse artillery in crowded lines ; 3rd, a battery of field artillery with enormous superficial area ; and 4th, a regiment of native cavalry with unlimited superficial space on ground not previously occupied.

We find that under these different conditions Anthrax has appeared in one and all, and it would seem that we have nothing here to draw conclusions

from. We notice that the two field batteries and Lancer lines are contiguous, and closed in on one side by the barracks, and on the other by the horse-keepers' parcherry; these lines are not only too crowded, but too much closed in. The Horse Infirmary common to the field batteries, as shown in Local Investigation Report, is situated close to the public road and open to trespass of cattle, goats, sheep, etc. A four-feet mud wall would remedy this evil. This remark applies generally to all open lines.

2. STABLE FLOORING.—The stable and picket floorings throughout the cantonment of Bangalore are faulty in construction and in material, the latter especially so.

We have noticed under "B" the superiority of the floorings at Hosúr, which we would recommend being adopted throughout the service where the horses are stabled, but for exposed pickets we do not think (owing to the amount of clay used in construction) that it would answer; but if the object aimed at, viz., prevention of percolation of fluids, is to be overcome, we can only recommend the more costly mode of cemented concrete. We notice that at Bellary there is a second set of pickets, one for dry, the other for wet weather. This we think an excellent idea, and is perhaps capable of still further improvement if a complete double set of lines could be established in all regiments and batteries, one of which could be occupied alternately in wet and dry weather. The reason for this is obvious.

3. We find in Madras S.G.O., No. 115, of 13th December, 1883, page 274, para. 3, the recommendation of the addition of lime to the material for stable flooring. We have already shown that lime is a necessary chemical constituent for the growth of *bacillus anthracis*. Its use as a disinfectant is also recommended in the same S.G.O. Experiment has proved that a portion of Anthrax tissue exposed to the action of quicklime for several hours, still possesses the power of producing the disease on inoculation.

Para. 30 of the above S.G.O. directs the removal of tainted picket earth to without cantonment limit; this would form another focus of infection, and we would suggest that the surface soil of pickets should be purified with fire before removal.

4. MANURE, DISPOSAL OF.—The arrangement for this is most defective. The contractors who purchase the manure are capricious in removing it; much depends on the season of the year, the use he has for his bullocks, and the state of the roads. As a sanitary measure, we recommend the introduction of paved and covered manure receptacles, similar to those in use in the Silladar horse lines. No accumulation of manure should be permitted. Should there be unavoidable delay in emptying them on account of rain or for other reason, there would be no fermentation or saturation of the surrounding soil.

5. WATER.—As before noticed, the water-supply of Bangalore is from the Ulsoor tank, and the remarks already made under heading "Water" will show that it is not above suspicion. We can only recommend the strictest conservancy of the tank, rigid exclusion of cattle, and prohibition of direct water lifting in chatties for domestic uses. The construction of walls at convenient intervals round the tank would probably obviate the latter contamination. The water-trough of the field battery sick lines and that of M Battery, 2nd Brigade, Royal Artillery, are dangerously close to a public road, and open to pollution as shown in the Local Investigation Report. Both of these should be enclosed or removed to a place where they can be guarded against pollution.

With reference to the water-supply for the native cavalry, already noticed under its proper heading, we recommend that either Ulsoor water should be laid on or a well sunk for the use of the regiment.

6. GRASS.—Roughly estimated, there are, including civil, military, trans-

port mules, etc., about 4 000 horses at Bangalore, and it cannot be wondered that the quantity and quality of grass is so difficult to supply, and this particularly the case during the dry months of the year. The fact of the grass-cutters in this army being women increases the difficulty, for they are under no control. We have already pointed out the possibility of grass being cut in infected places, and this under the present system is impossible to obviate. The present method of grass supply is so radically bad that we fail to see a way of suggesting any improvement, except that of setting apart certain lands sufficiently near to Bangalore to admit of daily coming and going with a head bundle ; this, we understand, is out of the question, owing to the high value of land in the vicinity of the station, and we need not point out that the acquisition of a large tract of land in foreign territory would offer some difficulty in obtaining.

7. HAY SUPPLY.—The climate of Mysore, for the most part, and particularly that near Bangalore, is favourable on account of its well-distributed rainfall for the growth of hay, and it has for many years past been an industry in the compounds of cantonment ; its cultivation as a special industry has been carried on at Ooscotta—a town about eighteen miles from Bangalore. From information we obtained from the Deputy Commissioner, Captain Macintire, we understand that the cultivation of hay is capable of still greater extension, and, if sufficient notice could be given, he thinks the cultivation would be taken up and a supply created sufficient for all Government demand. While recommending the desirability of encouraging the growth of hay and its use in lieu of grass, we do not wish it to be understood that it would afford complete immunity against Anthrax ; for, as we have already shown, hay itself may be a source of infection, though *undoubtedly* not to the same extent as grass-cutters' grass.

8. RUMNA GRASS.—Rumna does not exist in Mysore, and the natural or wild grasses do not grow here as in the more northern stations of the Presidency. Moreover, formation of rumnas offers the same difficulties as that already pointed out in the case of lands proposed to be set aside for grass-cutters.

9. SALT.—We have already noticed the possibility of salt acting in some way as a prophylactic against Anthrax when dealing with section "*B*." It is not improbable that salt may in some way render the blood an unsuitable medium for the growth of *bacillus anthracis*, and we consider that an increased daily ration of salt should be given to the horses at Bangalore, with the view to test whether it really possesses this prophylactic property. The experiment would be a very inexpensive one, and might prove of great value. We are much struck with a statement made by the Government Cattle Inspector, Mr. Mills, who says that since the prohibition of Government against the manufacture of earth salt in the Kurnool district, cattle disease, which had hitherto been rare there, is as common now as in other districts.

10. INOCULATION.—Regarding inoculation as a preventive against Anthrax, we have little to say and nothing to recommend.

The subject of inoculation is still under experiment, and nothing has yet been definitely settled. Great care is required in the preparation of the so-called "vaccine," and it is not shown that this can be satisfactorily performed by any one but M. Pasteur, who keeps a chief portion of its process a secret.

Experiments have been made with "vaccine," and instead of immunity, Anthrax has frequently been produced. Again, it has not yet been demonstrated how long immunity will last ; it is probably for only a short time.

We do not feel justified, in the face of so much negative evidence and the limited knowledge of the subject, in recommending to the notice of Government "vaccination" as a *preventive measure*.

CONCLUSIONS.

11. Our conclusions from this inquiry are—

1st—Anthrax occurs in Bangalore amongst Government horses under all conditions of age, sex, breed, and stable management.

2nd.—We have shown that the infection may be conveyed either by the air, food, or water from infected spots.

3rd.—The primary sources of infection may be carcasses or excreta of diseased animals. We have also pointed out that the disease may, under suitable conditions, arise spontaneously (*vide* paras. 41-45, "Hay"). Accumulations of organic matter, offal, etc., are shown to be most favourable to the development of *bacillus anthracis*.

4th.—With the object of reducing the number of sources of infection to a minimum and to avoid the causes of infection as far as possible, we recommend stricter attention to cantonment sanitation, and have made recommendations on certain points, which we here reiterate—

(*a*) Disposal of manure.
(*b*) Cleanliness of lines surroundings.
(*c*) Prevention of intrusion of cattle, etc.
(*d*) Professional supervision over slaughter cattle at all the slaughter-houses in and out of cantonment.
(*e*) Disposal of offal from slaughter-houses.
(*f*) The cremation of carcasses of Government horses which die from contagious disease (already provided for in the S.G.O. previously quoted), and we would strongly urge the necessity for similarly disposing of private horses and cattle which die of Anthrax, which, if left exposed, would prove fresh centres of infection.
(*g*) Wells provided for civil population, instead of present system of pollution of Ulsoor tank.
(*h*) More perfect attention to the watering-troughs, and construction of a well for 1st Light Cavalry lines.
(*i*) The disestablishment of grass-cutters in whole or part, and formation of grass or hay lands.
(*j*) The formation of double sets of lines.
(*k*) Improvement in method of stable flooring.
(*l*) An increase in the daily ration of salt.

12. The Committee do not feel themselves justified in going beyond the above recommendations in their present state of knowledge of the subject.

We are now "in the dawn of a new era," and in the words of Dr. Cornish, Surgeon-General, Indian Medical Department, in his address before the South Indian Branch of the British Medical Association, he says, when referring to the labours of those eminent scientists, Dr. Koch and his colleagues, who are now in India investigating the subject of Cholera—"an era in which things that we see and know but dimly will stand forth in broad and dazzling light"—Cholera, Anthrax, and other zymotic diseases are so intimately connected one with the other, and the revelations expected are so important, that we feel it would be presumption to go beyond what we have recorded.

The Committee, while feeling their powerlessness to grapple with so insidious a disease, or to suggest any positive preventive beyond increased sanitation, are satisfied that they have duly weighed both sides of the question, and, if nothing else, they have collected a mass of facts which will be useful for further investigation.

(Signed) W. PAYN, *Lieutenant-General President.*
(„) F. G. SHAW, *Inspecting Veterinary Surgeon.*
(„) W. S. ADAMS, *Veterinary Surgeon, 1st Class.*
(„) J. MILLS, *Veterinary Surgeon and Inspector of Cattle Diseases.*
(„) F. SMITH, *Veterinary Surgeon.*

} *Members.*

Review.

A Text-book of Operative Veterinary Surgery. By George Fleming, LL.D., F.R.C.V.S., Principal Veterinary Surgeon to the Army. (London: Balliere, Tindall, and Cox. 1884.)

This work, when finished, will supply a want which has always existed amongst the English-speaking members of the veterinary profession in every part of the world. The books upon veterinary surgery hitherto published explain the methods of performing some of the most important operations, but frequently in such a way as to be of little use to men who have not already had considerable experience. In the work now under review nothing is omitted; even the youngest practitioner will find his every need met, and the descriptions sometimes almost unnecessarily minute in their details.

The opening chapters contain a full account of the blinds, twitches, hobbles, and other apparatus employed in various countries for securing animals, and the best ways of using them. Numerous engravings are given, which materially assist the reader in comprehending the text. Among these is an illustration showing a peculiar method of casting the ox by means of a rope looped round the neck and body. It is called "Rueffs' method," but it was in ordinary use amongst the natives of Bengal many years ago, the only difference being that, to the best of my recollection, the neck was left free. It is difficult to understand why the act of tightening two loops, one round the chest and the other round the loins and flanks, should force an ox to lie down; but certain it is that the animal drops as soon as the two ends of the rope are pulled.

Some pages are devoted to a discussion upon the causes of the occasional fracture of vertebræ when horses are cast, and the best means of avoiding such a misfortune.

There is a whole chapter upon the administration of anæsthetics, containing recipes for compounding the most useful kinds, and some excellent practical remarks upon the employment of chloroform, by Mr. Roalfe Cox, a veterinary surgeon in the West of London. He has performed all operations upon animals under the influence of that agent for more than twenty years, and out of hundreds of cases has never seen a horse injuriously affected by it.

The various instruments required in performing operations are described, and illustrations are given showing the proper ways of holding them when in use.

In the remainder of the first part of the book the most important subjects are the prevention and arrest of hæmorrhage, the various methods of closing wounds, and of applying bandages to all portions of the head, body, and limbs.

In the commencement of the second part, twenty-five pages are filled with a description of dislocations and fractures, and their treatment; following which are chapters upon the removal of tumours, upon cauterization, setons, hypodermic and other injections; operations on blood-vessels, muscles, tendons, ligaments, and nerves, amputations, extraction of bullets and other foreign bodies from wounds, and trephining.

The book contains no less than 295 engravings, which greatly assist in elucidating the printed descriptions.

Many good practitioners, a few years after leaving the veterinary colleges, are liable to find their anatomical knowledge of certain parts somewhat hazy when called upon to perform unusual operations. In such cases a reference to this work will greatly diminish the risk of mistakes, which might possibly cause pecuniary loss to the owner of a valuable animal, and extreme mortification to the feelings of the operator. But it is no exaggeration to say that the most experienced and skilful veterinary surgeons cannot fail to profit by a careful perusal of the book. The author evidently intends it to be a complete guide to the performance of every operation which can well be required in the treatment of any of the domesticated animals. The very moderate price (half-a-guinea) at which it is issued by Messrs. Baillière, Tindall and Cox, places it within the reach of all, and it is to be hoped that the second volume will not be long in making its appearance.

J. J. Meyrick, F.R.C.V.S.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Quarterly Meeting of Council, held July 29th, 1884.

Professor Walley, President, in the chair.

The following members of Council were present: Gen. Sir F. Fitzwygram, Bart., M.P.; Dr. Fleming; Professors Robertson, Williams, McCall; Messrs. E. C. Dray, Henry Simpson, F. W. Wragg, J. Harpley, William Whittle, William Woods, H. J. Cartwright, T. Greaves, P. Taylor, F. Simcocks, B. Cartledge, J. D. Barford, W. Duguid, J. Cox, and the Secretary.

The President said, before the business of the meeting commenced, he wished to thank the Council for the kind manner in which they had elected him to the office of President. He must confess that when last he was in the Council-room he had not the slightest idea that such an honour would be conferred upon him; while he had further to acknowledge that when twenty-

two years since he was a candidate for the diploma of the College he little thought that he would occupy the position which he was so proud to fill that day. There were a few things always looked for in the President of a Council of this kind. The first was that he should have plenty of time at his disposal, the second that he should have plenty of money at his disposal, and the third that he should be both willing and anxious to devote all his energies to the good of the College. He confessed that he could not fulfil the two first conditions, but he thought they would give him credit at least for being anxious to carry out the third condition, and he hoped that at the end of his period of office none of them would be able to say he had neglected any duty necessary for him to perform. Certainly his means of attendance might not be so great as he could wish, and perhaps being a little fresh to the office he might not be able to carry on his duties at first quite as smoothly as could be desired, but with the good help of the Council and the good help of those who had preceded him as occupants of the chair, he trusted that the Council would not have to repent the choice they had made.

The business of the meeting was then opened by

The SECRETARY reading the notice convening the meeting.

The minutes of the previous meeting were read and confirmed.

Absentees.

The SECRETARY read letters of regret at absence from Messrs. Santy, Walters, Perrins, Blakeway, and Reynolds.

Presentation to the Council.

The SECRETARY announced that a presentation had been made by Mr. Charles Percival, A.V.D., of some plates which had been his father's.

On the motion of MR. DRAY, seconded by MR. CARTLEDGE, a vote of thanks was passed to the donor.

Correspondence.

The SECRETARY read a letter from an unsuccessful student. It was ordered by the Council that the letter be acknowledged and laid upon the table.

Report of the Court of Examiners.

The SECRETARY having read the report,

The PRESIDENT pointed out that several of the students had been put down as having passed with "credit." He was not aware of any such honour, the marks being confined to "great credit" and "very great credit."

The SECRETARY explained that the examiners had used the term, because though the student in question had not passed sufficiently well to have "great credit" placed against him, he had yet shown greater ability than that required merely to pass the examination.

Mr. WHITTLE moved that the word "credit" be expunged.

Mr. WOOD seconded it, and the motion was carried, as was also a motion for the adoption of the report.

Fellowship Degree.

The SECRETARY read the names of the successful gentlemen in this examination.

The list was accepted and adopted by the Council.

Finance Committee.

The SECRETARY having read the report of this Committee,

Mr. DRAY drew attention to the extra charge for the use of the room in which the annual dinner had been held. He had also to complain, as last year, of the charge of ten guineas for vocalists, and of £5 for dinner tickets for vocalists. There was also a charge of 7s. 6d. for refreshments supplied to musicians. He thought the College funds should not be used for payments such as these, but that charges of this character should be borne by those who attended the dinner. He begged to move the following resolution: "That no expenses incurred at the annual dinner be defrayed from the funds of the Royal College of Veterinary Surgeons in future."

Mr. WHITTLE seconded the motion, which was supported by Professor Williams.

The PRESIDENT having remarked that he was entirely in accord with Mr. Dray's motion,

Mr. CARTLEDGE moved as an amendment, that the words "without the consent of the Council" be added to the resolution. It would be unwise to adopt any hard and fast rule. He remembered that when Mr. Mundella and several other officials of the Privy Council attended their dinner it was thought to be an act of politeness to make the proceedings as enjoyable as possible, and should they have any distinguished visitors on any future occasion they would be restricted by the resolution, if passed from incurring any expense which would be necessary in order to make the proceedings satisfactory in their nature.

Mr. WHITTLE thought a hard and fast rule was required. If there was any necessity for variation in the usual programme let the Council bear the expense amongst themselves, but by no means would he have the funds of the College taxed in the way they had been in connection with the dinner.

Professor MCCALL seconded Mr. Cartledge's amendment.

The original motion having been put and lost, the resolution as amended was carried.

The necessary cheques were ordered to be signed for the current liabilities.

The report of the Finance Committee was then adopted.

House Committee.

The SECRETARY read the report of this Committee, in which they recommended to the Council that the Secretary be empowered to make an offer in the terms as proposed in the letter from Mr. Beeston, the estate surveyor.

The PRESIDENT said that in the matter of the proposed new buildings there had been laid before the Committee a proposition in reference to a house in Bloomsbury Square. £4,500 had been asked for it on a seventy-four years' lease, and, in order to provide a room fit for the Council meetings, extensive alterations would have to be carried out, and that having been done, there would be a large portion of the house entirely useless as far as convenience for the Council was concerned. Under these circumstances the Committee had not felt themselves warranted in taking any further action in connection with these premises. Subsequently the architect and surveyor of the house in which they were then meeting was spoken to as to putting into the hands of the College the site of the present building, so that the new premises might be erected thereon. The architect said that the present site could, he thought, be had on a sixty-three years' lease at a ground rent of £64 per annum; that it would cost the College to build such premises as they required for the accommodation of the Council about £2,000; and that a house for the Secretary, if provided for, would necessitate over an additional £2,000

expense. The option might be given to the Council during the first three years to purchase the freehold. If that could be done, he (the President) thought it would be far better than taking a building on a lease of sixty-three years. There was a little bit of sentiment no doubt in connection with the wish to remain at the old place, but if anything more advantageous could be obtained, of course a matter of feeling could not be allowed to stand in the way. He thought, however, it was time that something definite should be done.

Mr. GREAVES thought it was decidedly the best plan to have a new building erected on the present site, which would answer the necessities of the Council and be a credit to the profession.

Professor WILLIAMS proposed that the matter be left in the hands of the Committee.

Mr. SIMCOCKS asked if it was understood that they were to purchase the freehold?

Professor WILLIAMS.—Most decidedly.

Mr. GREAVES said if the freehold was purchased and premises erected, it would be an investment for future generations, whereas, if the house in Bloomsbury Square was taken, the expenditure of £4,500 upon it would be gone for ever.

The PRESIDENT moved the election of Mr. Dray as a member of the House Committee, on the ground that he was one of the oldest members on the Board, and also because he held the important office of Treasurer and was located in London.

Mr. WOODS seconded the motion, which was agreed to.

Mr. SIMPSON, as a member of the House Committee, was not prepared to go the length of agreeing to accepting the present site on leasehold if the freehold could not be purchased.

The PRESIDENT remarked that the district surveyor had pronounced the existing building as unfit for habitation, and as positively unsafe, so that something must be done without delay.

Mr. SIMPSON said if the premises were pulled down another place would have to be found in which the Council might meet; and he would venture to suggest that the Society of Arts' room should be engaged. At any rate, it was better not to rush into unnecessary outlay, and take the site on a leasehold.

Mr. COX questioned whether the Committee as a House Committee could be entrusted with matters which ought to be considered by a Building Committee.

The PRESIDENT suggested that the Committee should be entitled the House and Building Committee, and moved a resolution to that effect, which was seconded by Mr. DRAY, and agreed to.

Mr. HARPLEY moved that the name of Sir Frederick Fitzwygram be added to the Committee.

Mr. DRAY seconded the motion, which was carried.

The PRESIDENT said there was next to be considered the house for the Secretary.

The SECRETARY said that the present house, as already reported to the Council, was really not fit for habitation. The domestic arrangements were imperfect, while the place was deluged whenever a shower of rain occurred.

The matter was ultimately left to the Committee to be considered at an early future meeting, with powers to act.

Registration Committee.

The SECRETARY read the report of the above Committee, together with their recommendations in cases of complaints, both from members of the College

and from registered practitioners, with regard to persons practising contrary to the Act. The Committee having carefully considered each case of complaint, recommend that the Secretary be authorised to send a cautionary to the offending persons, and that with regard to the more serious charges of complaint, particularly in respect to those who transgress under Clause 16 of the Act, the consulting solicitor to the College should be consulted. It was also recommended that in cases where solicitors had applied to conduct the prosecution for their clients under Clause 19 of the Act, the Council should allow them to do so, of course at their own cost. The Committee, in addition, recommended the appointment of Mr. George Thatcher, of Doctors' Commons, as solicitor to the College, and that in case counsel be required, Mr. Morton Smith, barrister-at-law, be consulted.

Professor WILLIAMS asked if there was not already a solicitor appointed.

Mr. HARPLEY thought Mr. Wilkinson was the solicitor.

Dr. FLEMING said he was under the impression that Mr. Wilkinson was not, nor had he for many years acted for the College, and gave reasons why that gentleman was not employed.

The PRESIDENT suggested that, in order to remove any doubt, it would be necessary for some one to propose that Mr. Wilkinson's appointment be cancelled.

Mr. DRAY moved a resolution in accordance with the suggestion, which was seconded by Mr. WRAGG and agreed to.

Mr. SIMCOCKS thought it would be necessary to employ an attorney conversant with criminal practice.

The SECRETARY said the gentleman proposed (Mr. Thatcher) was well acquainted with the working of the Act.

On the motion of Mr. DRAY, seconded by Mr. WRAGG, the report of the Registration Committee was adopted.

Appointment of Examiner in Chemistry for the London Board.

Professor ROBERTSON proposed Mr. Heaton (who he said was Lecturer on Chemistry to the Charing Cross Hospital, and author of one of our popular text-books) for the office, remarking that the College ought to have as high an authority as possible upon the scientific subject of chemistry.

Professor WILLIAMS seconded the proposition.

Mr. GREAVES proposed that Mr. Stevens, a member of the College and a pharmaceutical chemist, be elected, holding that the College should have its work done by members of the profession. He thought if that practice were adopted young men would be encouraged to become fit for Examiners, and if such offices were withheld from them it would be a serious loss to the profession.

Mr. DRAY seconded the motion.

Mr. SIMPSON thought it was a great honour to have men eminent in chemical science connected with the College as Examiners, and for that reason he thought Mr. Heaton was to be preferred.

A ballot was then taken, with the result that Mr. Heaton was elected.

Date of next Quarterly Meeting.

In answer to a question by Mr. WHITTLE on this subject,

The PRESIDENT said he would endeavour, if it was possible, to arrange that the meeting should take place on Thursday, the 2nd of October next.

The Royal Agricultural Society and Veterinary Surgeons.

Mr. SIMPSON moved : "That a committee be appointed to place itself in communication with the Council of the Royal Agricultural Society in refer-

ence to the proposal of the said Council to appoint a consulting veterinary surgeon for the whole of each county, and assign to such veterinary surgeons certain privileges relating to the sale of medicines and drugs throughout the districts for which they are appointed."

He drew attention to a pamphlet, "On the Domestic Veterinary Treatment of the Animals of the Farm," by Professor G. T. Brown, which he stated had originally appeared as a paper in the *Journal of the Royal Agricultural Society*, but had since been published separately, price sixpence. It had been arranged by the Royal Agricultural Society that Professor Brown should draw up a list of names of the veterinary surgeons to be appointed, for the consideration of a Council of the Royal Agricultural Society.

Now, his (Mr. Simpson's) fear was, the Society was going to do something which would press very hardly upon members of the profession.

He believed the country was supplied with veterinary surgeons well able to attend to the agricultural community, and that to select one man in each county as the recognised authority on veterinary matters would be detrimental to the interests of the other practitioners, though this should not weigh if a necessity actually existed.

The selected veterinary surgeons were, moreover, to be asked to supply in their county the medicines recommended by Professor Brown in the pamphlet, and thus, instead of local veterinary surgeons as heretofore supplying their clients with medicines, there was the fear that the appointed veterinary surgeon would become retailer of medicines for all his county if he was what is called a pushing man. With regard to the pamphlet, he (Mr. Simpson) recommended every member of the profession to buy one, the tenor of it was —use the remedies and put off sending for a veterinary surgeon as long as possible.

He feared a very considerable portion of a rural veterinary surgeon's income was doomed, as the reader of the pamphlet would now go for his medicines either to the veterinary surgeon for the county or to the druggist. And already in an influential sporting paper he had seen an advertisement of the remedies recommended by Professor Brown in his pamphlet on sale by a firm of druggists.

He knew the Royal Agricultural Society was actuated by the best feeling towards the veterinary profession, but he believed the whole thing was a mistake, and if a representation was made to the Society by this Council he believed benefit would result.

The PRESIDENT thought that it would do a great deal of harm to the profession to put the stamp of a man of so high a position as Professor Brown upon a system which seemed to go in the direction of converting veterinary surgeons into mere dispensers. The most objectionable thing about the proposal was that it implied that a veterinary surgeon, in his own district, was not capable of supplying drugs in such cases as those referred to by Professor Brown. He (the President) knew what it was himself to contend with the men who flooded the country with their cattle medicines, and very often the cream of the profit of the district was taken from the veterinary surgeons. Unfortunately, the proposal of the Society was just on the lines of the procedure of such men, putting into the hands of people medicines prepared by chemists and druggists. It was the place of the Council to take into consideration all circumstances affecting the welfare of the profession, and if it was thought that the proposed committee to meet with Professor Brown and the Agricultural Society would be of service to the profession in this matter, it would be its duty to give consent.

Professor WILLIAMS seconded the motion.

Mr. SIMCOCKS thought it hardly worth while that the College should go hat in hand to the Agricultural Society, because the mischief had been done

already by the publication and circulation of the pamphlet. He considered the Society had acted within their right, because it was their province to guard the interest of the farmers.

Mr. SIMPSON said it would hardly be right to do so if it involved a wrong to veterinary surgeons.

The motion was then put and carried, the following being the gentlemen nominated to form the Committee: The President, Mr. Cartwright, Mr. Wragg, Mr. Dray, Mr. Simpson, Mr. Greaves, and Mr. Cox.

Matriculation Examination.

The PRESIDENT said that the Royal College of Preceptors had been appointed to carry out this examination, but, inasmuch as that body did not exist in Scotland, there had been a difficulty in complying with the bye-law in the matter. He therefore moved: "That in Scotland the Educational Institute be accepted as the examining body in lieu of the College of Preceptors."

Mr. SIMCOCKS seconded the motion, which was agreed to.

Obituary.

The SECRETARY read the names of members of the profession recently deceased, amongst them that of Mr. Cowie, of Dulwich Common.

The PRESIDENT said that Mr. Cowie had been for a long time a member of the Examining Board, and was well known and respected in the profession. The least the Council could do would be to instruct the Secretary to forward a letter of condolence to Mrs. Cowie in her bereavement.

This suggestion was unanimously adopted by the Council.

Notices of Motion.

The following notices of motion were given:—

Professor MCCALL to move: "That at the C or final examination the number of individual Examiners be such as is indicated by Bye-law No. 7, relating to examinations. That is to say, that two separate and distinct individual Examiners conduct each department or section of that examination, or that four additional Examiners for the C examination be appointed."

Professor WILLIAMS to move: "That at the C or final examination, the oral precede the practical; that if the student pass the oral, he shall be allowed to present himself for the practical at the same meeting of the Board, and if successful obtain his diploma; but if he fail at the practical examination he shall only be compelled to present himself for examination in the practical, and at such a time as the Board may determine; the student thereafter to have the privilege of obtaining the required practical knowledge, either at his college, or to furnish evidence that he has in the interim been under the tuition of a qualified member of the Royal College of Veterinary Surgeons."

Mr. SIMCOCKS to move: "That at the final or C examination a written examination be added to the oral and practical."

The PRESIDENT to move: "That the salary of the Secretary for the Scottish section of the Board of Examiners be increased."

On the motion of Mr. DRAY, seconded by Mr. GREAVES, a vote of thanks to the President was unanimously passed, the proceedings terminating with the acknowledgment of the compliment by Professor Walley.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE summer quarterly meeting was held at the Queen's Hotel, Leeds, on Wednesday, 23rd July, the President, Mr. Parlane Walker, in the chair.

The following members were also present, viz. :—Messrs. M. E. Naylor, T. Greaves, Jos. Carter, J. W. Anderton, J. M. Axe, Peter Walker, B. Smith, T. C. Toop, W. F. Greenhalgh, G. Whitehead, A. W. Briggs, Bell, Pickering, P. Carter, J. H. Ferguson, and the Secretary. Messrs. McCormick, Pollard, H. J. Axe, and T. E. W. Lewis were present as visitors.

Messrs. Dray, Bale, Danby, H. Carter, G. Carter, Jas. Freeman, Jos. Freeman, sent excuses for non-attendance.

The minutes of the previous meeting were read and confirmed.

The SECRETARY read a letter from the Hon. Sec. of the Western Counties Association, desiring mutual co-operation in supporting the election of members of council. A letter was read from Mr. Jas. Freeman, acknowledging the sympathy of the members in his long affliction.

Mr. ANDERTON nominated Mr. Herbert Pollard, Wakefield ; Mr. NAYLOR proposed, and Mr. ANDERTON seconded the proposition, that a letter of condolence from the members of this society be forwarded to Mrs. Falding and family, expressing sympathy with them in their affliction.

The SECRETARY and Mr. GREAVES made a few remarks, exhorting the members to attend the meeting of the National Veterinary Medical Association at Manchester the week following.

Mr. GREAVES read his paper on "The Nature and Prevention of Glanders," expressing the opinion that in all cases this disease is caused by the presence of micro-organisms in the blood. He considered that although the symptoms of the disease varied, the presence of ulceration of the Schneiderian membrane and Farcy buds are characteristic of the malady.

Mr. NAYLOR said the disease might remain in a horse undetected for an almost indefinite period, and continue to be the medium of contagion. He thought the adherent state of the gland to the inf. maxillary bone a certain symptom of Glanders. He considered that where bad ventilation existed in stables Glanders would invariably exist, and related a singular case of glanderous matter being thrown upon the eyelid of a man, thereby producing the terrible malady.

Mr. PETER WALKER said, in the absence of some of the diagnostic symptoms, he had noticed occasional discharge of blood per nostril, the ulcers being situated high up the Schneiderian membrane.

The discussion was continued by Mr. JOS. CARTER, the SECRETARY, and Mr. P. CARTER, who argued that Glanders may be produced by bad ventilation, or through septic poisoning. They agreed that the symptoms varied, and required strict watching.

Mr. TOOP said in nearly all cases of Glanders the lungs are primarily affected. The disease being a blood affection, tubercle of the lungs may exist long before any of the external diagnostic symptoms appear. He said that Pasteur and Koch had succeeded in isolating the virus or micro-organisms of Glanders.

Mr. NAYLOR proposed, and Mr. BRIGGS seconded, a vote of thanks to Mr. Greaves for his kindness in introducing the subject for discussion. (Carried unanimously.)

The PRESIDENT read a paper on

Overstocking in Cows.

VICE-PRESIDENTS AND GENTLEMEN, The subject of my paper is overstocking of milk in cattle. I don't intend it to be a long paper, but one directed rather to the elucidation of this, that has hitherto from various causes been a subject which has, so far as I have been able to gather, never engaged that attention it has deserved at the hands of our profession.

My study of the matter has been drawn to it by a case of alleged torture to a heifer, that was brought before a local bench, and conviction obtained a few days ago. Members of our profession, from Principals downwards, were subpœnaed *pro* and *con*, and in my humble opinion it was astonishing what an absence of definite ideas or conviction was shown. We seem to be in about the same state of knowledge on the subject that our forefathers were in before the Flood, and from some cause, either of insufficient information or from a too ready disposition to take for granted that cruelty *must* exist, erroneous statements, I believe, are made the means of opinions being propagated which a closer study of the subject might prevent; or it might be that some of nature's laws are too simple for our notice. We have no time to enter at length into the physiological and anatomical aspect of the question, and I shall only touch them incidentally to enforce any practical deduction drawn from consideration of the matter. What does nature say to us in all its ramifications but this; is it consistent with the beneficence of an all-wise Creator that myriads of mammalia which, from accident or design, lose their offspring in the full flow of milk, should have no means of painlessly relieving their overcharged glands? As a matter of fact and notoriety you can call to mind observations and experiences promiscuously received, which will, no doubt, whilst I am speaking, convince you that nature does her work in a far grander way than to leave the poor creatures in a helpless state of torture. Have you not all seen the milk flow from domesticated animals under the circumstances described, producing a healthy condition? what more natural? Go a step further; most of you, no doubt, will be able to bear testimony to the painless operation of nature in the human subject. I know that I may be met by the remark that the cow has been developed into a milking machine; granted, but if nature is susceptible of development in one direction, can it not be accepted that a protecting capacity is also bestowed?

We shall look for a moment at the physiological change that takes place in the udder previous to parturition. The period of its development is much longer in the heifer than in the cow: in the heifer six or eight weeks from calving the udder begins to enlarge by the action of a greatly increased quantity of blood, which may be termed Hyperæmia, healthy congestion, or Honed. This determination of blood steadily increases, and acquires its highest state of development at parturition, not only in the gland, but in the surrounding tissue, sometimes reaching the whole extent of the perineal region, and a considerable length along the course of the linea alba, which produces a feeling of tenderness and distention, a very valuable sign. This swelling subsides gradually about ten days after calving; then the udder is in working order, and the animal in full flow of milk. We know that all this extensive swelling is there for the purpose of developing and preparing the gland (especially the milk-secreting cells) for active duty. The gland previous to parturition secretes a milky aqueous fluid, which no doubt plays an important part in putting and keeping the cells in tune, and to me it seems bad practice to draw it from the cow continually for six or ten days previous to calving.

The milk first secreted after parturition known as colostrum (or beastling) is very different from ordinary milk, and possesses a strongly purgative action,

which is useful in clearing the bowels of the calf. I may say that I believe that this secretion has also an important function to discharge in the gland itself, and I question if it is wisdom to drain it all immediately after calving; one fact we do know, nature does not do so.

As to the anatomy of the part, suffice it to say that, as we are aware, there is a round or sphincter muscle in the teat, for the purpose of preventing the milk flowing when the gland is not full; this very thin muscle is blended with yellow elastic tissue. Sucking, pressure of the hand, and distention, have all the power of opening it. At the centre of each quarter, just at the base of the teat, is a large sinus, the general receptacle of all the lactiferous conduits, and from this sinus, which is sometimes large enough to contain a quart, proceeds down the centre of the teat a definite excretory canal.

Now that we have got the cow in the full flow of milk, and that milking is neglected at the proper time, what is the result? The milk flows from the gland, and the cell secretion is partially arrested. *Why?* I reply, the fact of the reservoirs and ducts being charged with milk induces the secreting cells to retire partially to rest, and also diminishes the flow of blood for the time being, and, if allowed to stand for a few days, will in all probability produce temporary atrophy of the cells. Hence, the result of overstocking would be driving away the milk; the same thing will occur through the udder not being drained dry when milked. The secreting cells are in their greatest activity when the glands are empty. Some may say, What about the hard or stiff milkers? It is generally acknowledged that the stiff milkers are caused by white inelastic tissue blending with the delicate sphincter muscle. It may be so, but have you ever asked yourselves if this muscle is voluntary or involuntary, for I have long believed that the muscle or the structure of the gland itself is under the power of the will? How often do we find cows that will let down their milk to one person, and not to another; in fact, how often do we find cows that will not let it down at all until they get something to eat to draw their attention from the operation. This fact is most apparent at the period of œstrum, when you can draw the teats from fifteen to thirty minutes without getting a drop, but when the cow has changed her mind it will come freely, and you have a good milking. How often do we find good, free milkers made stiff milkers through abuse. I maintain the temper of the cow has much to do with it, and that may be developed by the free use of the buffet, stool, or some more convenient instrument of torture. We know that a free milker can be made otherwise by a bad-tempered milkmaid, and that a good-tempered milkmaid can generally milk any cow. The milk, when left in the udder, changes in its consistency: when drawn about the third day, sometimes it is thicker than usual, and at others it has a bluish watery appearance. There is no froth on its top, and it has a very saline taste, which is a clear proof to my mind that disorganisation has taken place preparatory to the absorbents taking it back into the system in its simple elements. From the appearance and size of the udder, you would expect four or six quarts, but will have to be satisfied with two or three gills; thus it is perfectly patent that the distention of the udder at this period is not altogether due to the milk it contains. I hold that cows can be put dry at any period of lactation, without pain or torture, and there can be no doubt but that nature's system of drying them is the best. The milk standing in the gland, I believe, has two important functions to perform, one previously mentioned, inducing the cells to rest, and the other rousing the absorbents to action; this state is attended with distention or healthy congestion, not to the same extent, but very similar to the cow preparing to calve. The same law holds good in the other domesticated animals. I have seen it in the cow, the bitch, cat, and sow. If it is torture to the cow it is much more so to the other animals named, inasmuch as they have a larger secretion

in proportion, and if a distended udder in the cow subsequent to calving is torture, may we not deem it a logical inference that the same torture exists under similar conditions before calving? Who is there amongst us that would advance such a proposition?

It is a universal practice in the spring, and at this season of the year, to turn out cows to grass giving from one to three quarts of milk, for the purpose of bringing them up in the back, and as back calvers. Some owners practise drawing the milk from time to time, others will go about the sixth day and milk them dry; others, again, leave them to go dry of themselves, and this, in my opinion, is the most natural and common-sense mode of practice, inasmuch as the more you draw them the longer they will be going dry. What does the owner find when he goes on the sixth day? The udder is distended from hyperæmia, healthy congestion, or honed; also in the perineal region and to some extent along the course of the *linea alba* he finds swelling, which is a determination of blood to the part for the express purpose of feeding and stimulating the absorbents while in action, whose office is to absorb the disorganised milk and carry it through the lymphatics into the thoracic duct.

Now, gentlemen, we come to the most important and vital part of my paper, How does the milk leave the udder? This is a question that the medical, as well as our own profession, has overlooked, a question most essential to the interest of the whole animal economy, and until we thoroughly understand it we are not in a position to give evidence in a justifiable manner. We shall look, not with a theoretical lens, but with a common-sense practical microscope, at nature's plan of drying the udder. One of the functions of the gland is to secrete milk, and there can be no two opinions but that the gland has also the power of disorganising the milk, and breaking it up into its simple elements; an operation attended with as little tenderness or uncomfortable feeling as the other. The extent of this distention, which produces a feeling of tenderness (another valuable sign), depends upon the quantity of the milk in the gland, and generally about the tenth day the swelling will have subsided and all will be well, but sometimes we have mammitis and suppuration, and even death of one gland or more, which has been believed to arise from not drawing the milk from time to time. Just imagine a cow cared for in a comfortable house, turned out to grass, and exposed to the night air, while the udder has to undergo the physiological change described. Do we not wonder that there are not more cases of mammitis? I believe the cow should be allowed to go dry before leaving her comfortable home; thereby we should have much less serious results, and none at all if she is thoroughly protected from colds and draughts.

Now then, gentlemen, if overstocking (independent of any artificial plugging) is torture, do you think that it could exist without leaving some bad results, such as the milk tinged with blood, etc., etc.? I would ask you as practical men, how often have you been called to treat cases resulting from overstocking; also have you ever seen any bad results arising from it? This is the proper method to arrive at a true issue of the question, an issue which seems to be as little considered or dealt with in the sister profession as in our own. I have made it my business to seek information at the hands of eminent medical men, and nowhere have I found a clear perception of the operation of nature under the circumstances set forth in this paper. And universally I have found that the rule of thumb, and unstudied ideas have obtained, which ideas have been overthrown by a discussion of the plainly indicated surroundings of the matter, and astonishment has been expressed at the utter absence of reliable data, study, or examination on this, which ought to be considered in the opinion of all with whom I have come in contact, an *initial* and *vital* question.

By way of conclusion I would just say that when in Ayrshire in practice, I never saw cows look so happy and jolly as when standing at the gate waiting for the milkmaid with their distended sides and udders, in many cases with milk flowing, and chewing the cud. I could liken them to nothing so much as to a Highland man with a few extra glasses of his mountain dew, *jolly fou*. Our cry is more light, and we trust the ventilation of this subject here, and elsewhere, will bring it, and so help us to declare authoritatively what is, or what is not torture.

In discussion the PRESIDENT denounced the practice of milking cows in the market to the extent of six or eight quarts and allowing the animals to stand exposed to wet, colds, and draughts, for hours afterwards, as conducive to evil results. If this is not cruelty it is the precursor of it.

Mr. BRIGGS said he had known mammitis produced from overstocking, but could not understand the good of the act, as it did not benefit the cattle-dealer or purchaser. He was of opinion the cow had no control over the teat or udder, as there was no voluntary structure in the udder.

Messrs. NAYLOR, AXE, PETER WALKER, and JOS. CARTER thought overstocking did not amount to an act of cruelty, as they had never known any injurious effects occur subsequently, and thought the cow possessed some control over the flow of milk.

The SECRETARY said overstocking was a matter of degree, and that in extreme cases unnecessary pain was caused. He would not give an opinion on a case of overstocking unless he examined the cow.

Mr. GREAVES said overstocking was not necessary and caused pain, and remarked that young beasts with small teats being unable to relieve the pressure of the milk, must suffer very much. He had seen mammitis arise from neglect of milking, and was quite sure it was an act of cruelty to drive a cow with an over-distended udder.

Mr. NAYLOR moved, and Mr. GREAVES seconded, a vote of thanks to the President for his paper. (Carried unanimously.)

The President and Mr. A. W. Briggs have promised to introduce papers for discussion at the next meeting.

W. BROUGHTON, *Hon. Sec.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 224.)

Inasmuch as every drug has a mode of action peculiar to itself, it must be given alone if you are to obtain the full benefit of its action; for combination with one or more different drugs must neutralise its own peculiar effect. Were it not really an ascertained fact it would seem incredible what an accumulation of remedies were mixed together in prescriptions during the seventeenth and eighteenth centuries; for instance, the Venice Treacle and Mithridate of the London Pharmacopœia of the Royal College of Physicians, the former contained sixty-five ingredients and the latter fifty. Dr. Paris, in his "Pharmacologia," attempted a defence of the theory of combination; but upon this subject he could hardly have been very thoroughly convinced, for he says elsewhere, "Simplicity should be regarded by the physician as the greatest desideratum. I was once told by a practitioner in the country that the quantity, or rather the complexity, of the medicines which he gave his patients—for there never was any deficiency in the former—was always increased in a ratio with the obscurity of their cases. 'If,' said he, 'I fire a great profusion of shot, it is very extraordinary if some do not hit the mark.' A patient in the hands of such a practitioner has not much better chance than a Chinese mandarin, who, upon being attacked with any disorder, calls in twelve or more physicians, and swallows in one mixture all the potions which each

separately prescribes! Let not the young practitioner, however, be so deceived; he should remember that unless he be well acquainted with the mutual action which bodies exert upon each other, and upon the living system, it may be laid down as an axiom that in proportion as he complicates a medicine, he does but multiply the chances of its failure. *Superflua nunquam non nocent*—let him cherish this maxim in remembrance, and in forming compounds always discard from them every element which has not its mode of action clearly defined and as thoroughly understood." This is good advice of Dr. Paris, and if followed out in its integrity must result in the prescribing one medicine at a time, for it cannot be declared of any compound, even though it contain two ingredients only, that its mode of action is either "clearly defined or thoroughly understood." A drug when administered alone is certainly more likely to act safely, nor is there the possibility of its action being neutralised or otherwise affected as when mixed with other drugs; it would therefore appear that, from a scientific standpoint, everything is in favour of the single remedy at a time.

But, to proceed, the next subject for consideration is that of Posology; many persons confound their minds by declaring at every available opportunity that this therapeutic law is nothing more than a system of infinitesimal dosage. Now, in order that I may arrest your attention, I shall rely upon the bluntest denial of this statement that I can make, and say it is nothing of the sort! So far as the law itself is concerned, it is quite independent of the dose; but it is also a fact that the followers of Hahnemann have found by experience that it is not necessary to successful treatment that drugs should be administered in considerable quantities. Nay, more, they have received the most abundantly convincing proofs that doses which are inconceivably small are sufficient to effect cures. When Dr. Hahnemann first put his newly discovered law into practice he was accustomed to administer ponderable quantities of drugs, but as time went on, and he gained more and more experience, the dose was again and again reduced until the attenuation of his remedies up to a very high degree was attained, and with but few exceptions the followers of this great master have down to the present day walked in the same footsteps. But I must reiterate my original assertion that the subject of the dose is quite an arbitrary matter; it has nothing whatever to do with the law; this reiteration I deem the more important that, whatever may be your ultimate opinion of the value of this law, you may be preserved from falling into the error of confounding the law with the dose, as many opponents have heretofore wilfully persisted in doing, thus proving how superficially they had studied the matter, and how lamentably ignorant of the truth they remained. This piece of practice has not been without its influence on writers of the orthodox school, notably Dr. Ringer, whose work on therapeutics is doubtless well-known to you all.

It will, I conclude, be acknowledged that when administering a given remedy for a diseased condition, it is not requisite to give so much of the drug as is necessary to produce a physiological effect, in consequence of the irritation, and hence the enhanced susceptibility of the affected organ or tissue; for instance, "ordinary doses of arsenic, against which even a healthy stomach needs to be shielded, would increase the irritation of one already inflamed," for which the law would direct its being given; the requisite conditions of such a case are that the proper remedy should be administered at a strength not sufficient to produce a physiological effect, but to extinguish the morbid state. The matter of the dose must, therefore, be one of experience. Infinitesimal quantities of drugs, the presence of which could neither be demonstrated by the microscope nor by chemical test, have been proved capable of curing disease over and over again. This to many has been a difficulty of so startling a character that it seemed incapable of being over-

come ; to ask a person to accept this doctrine of dosage, who had not fairly tested it, sounds very much like requesting him to forfeit his common sense ; but then there is no getting over the fact that infinitesimal doses have been the means of effecting cures after the administration of considerable quantities of drugs, and also after the do-nothing expectant treatment had been fully tested and failed; and it does seem, to say the least, unwise to refuse to accept the validity of a cure under such circumstances, because we are incapable of reasoning how it is an almost imperceptible quantity of a drug could act. But in order to show that very minute quantities of certain drugs are capable of producing marked effects, I will quote from Dr. Hughes, where he says, "Take the influence of atropia in dilating the pupil. The atropised gelatin, prepared by Savory and Moore under the direction of Mr. Ernest Hart, purports to contain but $\frac{1}{100000}$ of a grain in each disc ; yet it answers its purpose excellently well. Professor Donders (cited in the fourth edition of Pereira's 'Materia Medica') finds that in dogs the attenuation of atropia may be carried up to the $\frac{1}{700000}$th before the effect becomes doubtful ; and it is possible, from the experiments of Rossbach and Frölich, that the doubtfulness arose from contraction being produced by the drug when reduced below the dilating point. Professor Donders, moreover, adds : 'The sensitiveness of the eye to atropia, indeed, excites astonishment, when we consider that of the single drop of attenuated solution which suffices to produce dilatation, probably not a fiftieth part is absorbed.' Nor is it the pupil only that these dilute applications to the eye can affect. Dr. Harley records an observation of 'congestion of the entire conjunctiva, with dryness of the membrane and dull aching pain in the eyeball, lasting for several hours,' occurring after the instillation of twelve drops of a solution of one part in 400,000 of water. We have only to go somewhat lower in the scale of fractional minuteness to see the drug affecting the whole organism from within. Dr. Ringer finds the 200th of a grain of atropia, subcutaneously injected, sufficient to dry up the whole surface of the body, even when freely perspiring in the Turkish bath ; and Dr. Harley writes of this substance : 'An infinitesimal quantity—a mere atom—as soon as it enters the blood originates an action which is closely allied to, if it be not identical with, that which induces the circulatory and nervous phenomena accompanying Meningitis, Enteric or Typhus Fever.' Aconitine carries us a step farther. The 300th of a grain of this alkaloid was found by Dr. Milner Fothergill sufficient actually to kill a rabbit of three pounds weight ; while guinea-pigs are so extraordinarily sensitive to its lethal influence that one weighing a pound died in three hours and a half after the administration of the $\frac{1}{1130}$th of a grain. After these experiences you will not be surprised to hear that Professor Arnold, of Heidelberg, found tetanus readily produced in frogs by the $\frac{1}{10000}$th of a grain of strychnia. Even the $\frac{1}{100000}$th caused increased reflex excitability ; and in one of these creatures which the day before had been tetanic for some hours after the $\frac{1}{10000}$th had been administered to it, but had quite recovered, a slight attack came on in half an hour after receiving the $\frac{1}{100000}$th, which ended after some hours in its death." These facts, which Dr. Hughes so lucidly explains, exemplify the physiological effects of very minute quantities ; surely, then, we need no longer wonder that infinitesimal doses are quite capable of producing marked effects under pathological conditions ; hence Dr. Hahnemann's proposition that remedies "must be given in doses smaller than those employed for the development of morbid states in the healthy."

It would be to deal most carelessly with this subject were I to leave unconsidered the relation of pathology to therapeutics, if for no other reason than that the portion of the medical and veterinary professions who practise what is sometimes called "orthodox," or "rational medicine," consider the

basis of therapeutics rests in principle and application upon the facts of pathology. For the clear elucidation of this subject, as well as many other suggestions which have proved very helpful in the working up of this paper, I owe, and desire to make my acknowledgments to Dr. Carroll Dunham, in his able literary production, entitled, "The Science of Therapeutics." In order that there may be no misapprehension, it is essential that we should have a clear understanding as to the definition of terms. First, then, let me remind you that in studying the science of the tissues and organs of the healthy body you have to deal with physiological anatomy, and that the science of the functions of the healthy living organism is entitled physiology; the difference is at once apparent; in the same way when the tissues or organs of the body are affected structurally as the consequence of disease you have before you an opportunity to study pathological anatomy which may be observed either upon the living or dead organism; whereas when the function of any organ of the body is perverted, the study of the alterations constitutes the science of pathology, which can only be observed on the living subject.

"Pathological anatomy, then, is the science of the morbid tissues and organs of the diseased body. Pathology is the science of the abnormal functions of the diseased living body." Dr. Carpenter defines physiology as the science which treats of the phenomena of normal life, and pathology as the science of the phenomena of disease or abnormal life. But what is it that in disease or abnormal life is affected? Virchow says: "The chief point is to obtain a recognition of the fact that the cell is really the ultimate morphological element in which there is any manifestation of life, and that we must not transfer the seat of real vital action to any point beyond the cell." This cell is endowed with a power of attracting and drawing to itself what is requisite from the nutritive fluid to enable the particular organ so built up of cells to fulfil its ultimate destiny of secretion, etc.; should a certain secretion differ from what is found in the healthy organism to be its normal or healthy condition, then the cell is performing its function abnormally, and we recognise disease. The abnormal secretion is not the disease, but the result of it. Just so; "the abnormal functions and the altered tissues of the diseased body which are respectively the subjects of the science of pathology and pathological anatomy are not disease itself, but only the results of disease. These distinctions have a direct and most important bearing upon the science of therapeutics, which has for its object the cure of disease."

What we have to do, then, to effect cures, is to address ourselves to the application of such remedial measures as shall influence directly the abnormally acting cell; the use of diuretics, for instance, cannot properly be termed a therapeutic measure, inasmuch as their use involves a mechanical action for the removal through the urinary organs of effete matter; neither can the use of neutral salts for the solution of an exudation be termed a therapeutic measure; it is no more nor less than a chemical action. Pathology, therefore, while a most valuable aid to the practical application of therapeutics cannot possibly be accepted as the basis of cure. "Pathology is the science of disease based on a theory of observed morbid processes; therapeutics, when truly regarded, is a science of cure based on a theory of cure and resting on a foundation of experiment."

You will most probably expect that I should furnish some clinical proofs of the efficacy of the system I have been advocating; and abundant cases within my own personal experience are at my disposal, to say nothing of the hundreds and thousands of very remarkable cases cured under this system, after having been pronounced incurable under "rational medicine," that I might quote: but I prefer to confine this illustrative portion of my paper to one particular disease, the cure of large numbers of cases

of which was verified by parliamentary commission, and about which it is impossible for any one to cast any doubt. I refer to Cholera; that same disease for which Dr. Hahnemann prescribed the remedies, before he had seen a single case, merely from representations of the symptoms evinced in various stages of the disease, and which remedies have proved equal to the saving of many lives in the proportion of 16 per cent. of fatal cases as against 59 per cent. under "rational medicine"; the remedies being camphor, cuprum, arsenicum, and veratrum album, according to the stage of the disease. In a large majority of cases, if taken in time, viz., during the stage of invasion, when the sinking of strength, coldness, and anxieties present themselves, nothing more than camphor is requisite. Dr. Rubini, of Naples, during an epidemic, treated in conjunction with colleagues no less than 592 cases with camphor without a single death. In 1854, by order of the English Government, a Medical Council was appointed to gather returns of the treatment and mortality of Cholera under every method, a report of which was to be presented to Parliament. When the said Report was laid before the House of Commons, it was discovered by, I believe, the present Lord Ebury, that the returns of those practitioners who were followers of Hahnemann, together with those of the London Homœopathic Hospital, had been excluded; the House of Commons thereupon called for the returns that had been rejected and excluded by the Medical Council, and it transpired on the evidence of Dr. McLoughlin, an eminent physician of the orthodox school, who was Government inspector of Cholera hospitals by appointment of this same Medical Council that the mortality of Cholera in the London Homœopathic Hospital was 16·4 per cent., whereas during the same epidemic the mortality under "rational medicine" was 59·2 per cent.

Dr. McLoughlin in his report stated as follows:—"That there may be no misapprehension about the cases I saw in your hospital, I will add that all I saw were true cases of Cholera, in the various stages of the disease; and that I saw several cases which did well under your treatment which I have no hesitation in saying would have sunk under any other."

It would be, to me, intensely interesting to know what that sworn and bitter foe of Dr. Hahnemann and his principle, the *Lancet*, would say to this evidence. Of one thing I have little doubt, that in some way it would account for these same reports with a view to discredit them, for it seems to be a part of the mission of the *Lancet* to enact the rôle of Censor on all those who follow Hahnemann. It matters little, however, what the *Lancet* may have to say on this subject, for no amount of invective will stay the spread of this principle, and those who accept and practise it can well afford to smile at the leading medical journal when it becomes irate upon this subject. There is one more point worthy of your notice, before I close, respecting Cholera; as you are aware certain German pathologists allege that they have discovered, after researches made in Egypt and India, the cause of this disease; the germ-hypothesis is what they support, and yet once more we have another type of Bacillus. On Nov. 9th, 1883, there appeared an article in the *Pall Mall Budget* from the pen of Professor Ray Lankester, entitled "The British Government and the Cholera Germ." The Professor seems to think that the first time this suggestion was offered emanated from Dr. Lewis and Dr. Cunningham, when they were making researches in India some twelve or fifteen years ago; the Professor is either ignorant of the fact or prefers to ignore it, that, in 1831, Hahnemann published a paper in his "Lesser Writings," entitled "The mode of propagation of Asiatic Cholera," in which the following remarkable statement appears:—

"On board ships, in whose confined spaces, filled with mouldy watery vapours, the Cholera-miasm finds a favourable element for its multiplica-

tion, and grows into an enormously increased brood of those excessively minute, invisible, living creatures, so inimical to human life, of which the contagious matter of the Cholera most probably consists—on board these ships, I say, this concentrated, aggravated miasm kills several of the crew." This was in 1831, and is therefore slightly in advance of the German Commission, but I suppose, because it appears among the writings of Hahnemann, it is unworthy the consideration of such an eminent authority as Professor Koch. Other articles have appeared in the same periodical from the pens of great men of the present day, wherein the writers profess to have made discoveries that are the veritable A B C of practice among Hahnemann's followers; this is extremely amusing, and the thought at once arises in the mind, Whence obtained they their suggestions? are they really original conceptions?

I mention these things, not to discredit scientific workers of our own times, but to show how far Hahnemann was in advance of his own time, and therefore that the opinions of a man with such a mind and capacity as he enjoyed cannot be other than worthy the earnest consideration of all well-intentioned and serious men of the present day.

The statistics I have laid before you of the success attending the treatment of Cholera as compared with that obtained in orthodox practice are pregnant with suggestiveness: even 16 per cent. is a lamentable mortality, but when compared to 59 per cent., what can be said? Surely such evidence ought to arrest the attention of the most sceptical. For myself, I have long been satisfied of the truth of the principle; so much so that I am prepared to affirm as my sincere conviction that in "Similia similibus curantur" is to be found the only true law of healing.

Nearly all the members joined in the discussion, and after the essayist had replied, a cordial vote of thanks was awarded him for the excellent paper he had brought before the society. J. B. WOLSTENHOLME,

Hon. Sec.

Army Veterinary Department.

WAR OFFICE, *Gazette*, August 26th.

THE following gentlemen to be veterinary surgeons on probation:—Tom Marriott, Henry Aloysius Fullam, Henry Thomas Pease, Charles Henry Betser, George Henry Evans, Ernest Reuben Charles Butler.

Veterinary Surgeons Burt, Phillips, Griffith, and Bennett have left England for service with the Expedition to Khartoum. Veterinary Surgeons Dibben, Sartin, Davis, Joslen have embarked for a tour of service in India. Veterinary Surgeons Dawson, Healy, Killick, and D. Pallin have returned from India for duty at home. The Principal Veterinary Surgeon, Dr. Fleming, while on a tour of inspection in Ireland, accompanied by Inspecting Veterinary Surgeon Walters, was suddenly attacked by serious illness at Limerick on September 4th. He is now, however, progressing favourably towards recovery.

Obituary.

THE following deaths have been reported:—James Freeman, F.R.C.V.S., Hull, graduated Feb., 1834; James Hall, M.R.C.V.S., London, graduated March, 1842; A. M. Metherell, M.R.C.V.S., Brighton, graduated April, 1867; F. Unterberger, Dorpat, appointed Honorary Associate Oct., 1880.

We also hear of the death, on September 19th, of Thomas Davis Gregory, F.R.C.V.S., of Bideford, North Devon.

The death is also reported of S. H. Withers, F.R.C.V.S., of London, in the eighty-second year of his age. Mr. Withers was greatly esteemed by the profession in London and by a wide circle of friends. For many years he was a member of Council and Treasurer to the Royal College of Veterinary Surgeons.

Notes and News.

IMPORTS AND EXPORTS OF LIVING ANIMALS.—At length our leisurely Agricultural Department has put us in possession of the revised and complete figures relating to the imports and exports of 1883. The following tabular statement has been compiled from the new returns, as the readiest means of showing the sources of the imports named:—

	Horses.	Oxen & Bulls.	Cows.	Calves.	Sheep & Lambs.	Swine.
Russia	10	—	—	—	—	—
Sweden	22	17,989	4,808	4,522	7,958	—
Norway	8	870	117	—	2,837	—
Denmark	3,165	60,834	50,696	8,311	125,438	3,725
Germany	4,509	28,182	—	—	488,428	6,495
Holland	1,190	3,995	1,021	33,939	217,124	28,412
Belgium	271	—	—	—	90,281	—
Channel Islands	95	118	2,228	208	—	—
France	1,012	3,287	—	—	446	228
Portugal	—	21,886	—	—	—	—
Spain..	—	23,485	—	—	—	—
Victoria	—	—	1	—	—	—
British North America ..	12	52,048	1,087	—	94,285	—
United States of America..	92	154,982	74	—	89,083	—
British West India Islands	—	6	—	—	—	—
Other Countries	23	—	—	76	235	3
Total..	10,409	367,662	60,032	47,056	1,116,115	38,863

The value of these imports was :—Horses, £212,033 ; oxen and bulls, £7,929,246 ; cows, £1,183,477; calves, £219,519 ; sheep and lambs, £2,518,382 ; swine, £133,130 ; unenumerated, £30,347 ; total, £12,226,134. It is worth pointing out here that last year's imports of oxen and bulls were larger than they have been in any previous year. In 1869 the value of imported oxen, bulls, cows, and calves did not exceed £3,833,850, and in 1872 the amount fell down to £2,676,379. Three years later the figures were £4,885,462, and since then, with but two exceptions, there has been an annual increase, while nearly £3,000,000 more was paid away in 1883 than in the preceding year. The imports of sheep and lambs have not exhibited such an extensive development. The lowest point was reached in 1870, when our imports cost £1,151,373, and the highest figure was attained in 1883, when it stood at £2,558,827. With regard to last year's imports of poultry and game, alive or dead, including rabbits, we may add that the declared value was £591,895. As regards exports it appears we last year sent away 7,376 horses, which realised the sum o

£410,269. As many as 1,659 went to France, Belgium took 1,549, Holland 1,538, and Germany 448. British North America purchased 971, and the United States 862, while to Australasia we sent 71, and to the Argentine Republic 33, leaving 245 for distribution among other countries. On an average every horse sent out of the United Kingdom brought over £55. The exports of bulls, oxen, cows, and calves are included under one heading. They numbered 5,313, valued at £193,202. The greatest demand came, of course, from the United States, from whence we received £114,477 for 2,803 animals. British North America, however, purchased from the United Kingdom 2,007 cattle for the sum of £55,704. To the Argentine Republic we despatched 115 animals, to Chili 72, to Germany 49, and to Belgium 29, the remaining 238 going "to other countries" of which no indication is given. Our exports of sheep and lambs produced £42,759, the total number being 5,719. Very nearly 3,000 of these went to Germany, just over 1,000 to the Channel Islands, 600 to British North America, and nearly 500 to the Argentine Republic. The total exports of swine during the year did not exceed 373, but that the business was worth doing is apparent from the fact that they fetched £2,017, or nearly £6 apiece. In addition to the foregoing, we exported 4,118 living animals, not otherwise specified, the value of which was declared to be £16,747.

VETERINARY LITERATURE.—Mr. Henry Chaplin, M.P., has accepted the dedication of the "Manual of the Theory and Practice of Equine Medicine" by James Brodie and Albert Gresswell.

CHOLERA EXPERIMENTS ON ANIMALS.—Some interesting and, as some may deem, cruel experiments, writes a correspondent, have just been tried at Marseilles, with a view to ascertain how far dumb animals are susceptible of choleraic poison. The experimenters were Drs. Meati, a Swiss physician, and Rietsch, the victims three dogs and four guinea-pigs. Provided with the necessary appliances, these gentlemen, following the example of Dr. Koch, who visited their laboratory and favoured them with his advice, gathered thousands of cholera microbes from the intestines of still warm bodies, which the authorities placed at their disposal, and submitted the creators of the fell disease to various tests, the results of which will be made public for the benefit of science. The dogs and guinea-pigs were inoculated with bacilli, always with success. The creatures operated upon were invariably seized with diarrhœa and cramp, and otherwise showed the same symptoms as mark the malady in mankind. The guinea-pigs died in forty-eight hours at the utmost, the dogs in four days. The guinea-pigs in other respects manifested much greater susceptibility to the virus than the dogs. Instead of inoculating it, the experimenters in one instance injected the virus into a guinea-pig's intestinal canal. It died of Cholera. To make the inoculation operate more surely they also tied up the excretory biliary duct, and injected the virulent matter into the duodenum. In this way they proved that bile is a hindrance to the development of the microbes. In the blood of "cholerized" guinea-pigs, as in that of man, the globules are so softened as to prevent them from piling (*sempiler*), and they become deformed by reciprocal compression. This peculiarity is common to various conditions of Asphyxia. It is suggested that practical conclusions may be drawn from these facts. For instance, the inoculation of dogs and guinea-pigs is a sure way of diagnosing Cholera. When, henceforth, a town or a country is threatened by the epidemic, and doctors are in doubt as to the true character of a patient's symptoms, they may obtain positive knowledge within a few hours by injecting directly into a guinea-pig's duodenum part of the contents of the patient's intestinal canal. A second conclusion concerns a prophylactic against Cholera. The gastric juice and the bile are capable of destroying the microbes, and these two secretions are largely excreted in the

process of digestion rendered necessary by a meal, but they are hardly excreted at all when liquid alone passes through the stomach. Hence contaminated water is much less dangerous if drunk with a meal than when taken by itself. The parts played by indigestion and diarrhœa are of the same order, a fact which is regarded as a decisive confirmation of the relation between Cholera and bacilli discovered by Dr. Koch. Drs. Meati and Rietsch repeated their experiments last week in the Pharo laboratory before the hospital physician, the medical students, and the delegates from Barcelona.

Correspondence.

MENTAL IMPRESSION UPON FŒTUS IN UTERO.

DEAR SIR,—A chestnut cart-mare in foal was suffering from an injury, the surgical treatment of which needed the application of the knee-strap to restrain her movements. This was frequently used during a period of three weeks.

Some two or three months afterwards the mare foaled, and the young animal's near foreleg was bent in the same manner as her mother's had been when the knee-strap was applied.

We consider this fact of some interest, and forward you the particulars as illustrative of the influence of a mare's mind upon her fœtus.

12th September, 1884. EQUUS.

DEATH OF A COLT FROM DRINKING TAR.

DEAR SIR,—Thinking the following case of some interest and unique in its character, I beg to forward same for insertion in your next issue, and shall be glad to know if any of my fellow-practitioners have met with a similar one.

On the afternoon of August 11th ult., I was requested to see a yearling cart-colt which was off its feed. I found the animal standing up in one corner of the stable, with its head down and breathing quickly. Pulse 65 and full. The visible membranes were of a reddish-brown colour. The bowels were constipated, and the fæces had a peculiar dark coating. The urine was thick, and of a very dark red colour. The colt was first noticed to be a little dull and off its appetite two days before, but no particular attention was paid to it till the morning of August 11th, when it was thought to be in pain at times.

I noticed the sides and chest had patches of tar here and there, as if he had tarred his mouth and nose, and in brushing off the flies had smeared his body.

Upon inquiry I found they were tarring the farm buildings, and after a good deal of pressure the man admitted that when he fetched the colts in from the pasture on August 9th, this one just dipped his nose into the tar-tub as he passed it; but the man was quite sure he had not time to drink any.

I diagnosed the case as one of tar-poisoning, and administered ʒv. Aloes Barb. and Oss. Ol. Lini. cum ʒjss. Ol. Terebs. I also abstracted about Oj. of blood, which I found very thick and black, and with a decidedly tarry smell.

Some of this I placed under a microscope, but could detect nothing very definite for want of a higher power than I possessed. I particularly noticed that the blood would not coagulate.

I saw the colt early next morning, and found him, as I expected, much worse. He died in great agony about an hour after my arrival.

Post-mortem.—All the viscera and membranes were deeply stained, and of a reddish-brown colour; the blood remained fluid; the contents of the stomach and bowels were coated outside with tar, and there is no doubt the colt drank several pints. The day was intensely hot.—Yours, etc.,

Halstead, Essex. F. MORTON WALLIS, M.R.C.V.S.

"THE FINANCIAL CONDITION OF THE ROYAL COLLEGE OF VETERINARY SURGEONS."

SIR,—I have read with great interest your remarks on the above subject in last month's VETERINARY JOURNAL, and hope the Council will take the matter in hand at once, as the present state of affairs is very deplorable.

As Government does not appear disposed to help us in any way, it behoves the profession at large to help themselves, and I am quite sure that your suggested annual subscription of 10s. 6d. (I would rather say £1 1s.) from every member of the profession, would not be missed by any one of us, and would realise a good round sum. With it also we could have a museum and library, and be able to allow subscribers the privilege of using them, as, for instance, the Pharmaceutical Society do, their associates even subscribing 10s. 6d., and their members £1 1s. annually. Our motto, "Vis unita fortior," implies this plan of action, and the sooner some steps are taken in the matter the better. As affairs are at present, we are simply kept above water by the great exertions and munificence of a few individual members, and if an annual subscription were carried out, we should all be doing our quota for the general welfare of the profession, and be less likely to forget our alma mater as soon as we have passed its portals. The profession has made some rapid strides forward of late years, thanks to the efforts of certain noble-spirited individual members, and why let us retrograde, or stand still, with the preventive means in our hands?

JOHN GEORGE CROSS, M.R.C.V.S.

Shrewsbury, *September 13th*, 1884.

ALLEDGED CRUELTY TO A HORSE.

DEAR SIR,—The following is extracted from the *Manchester Examiner* of to-day, and is, I think, worthy of being recorded, especially when taken into consideration along with some statements made at our Congress in Manchester last month. Further comment is needless.—Yours faithfully,

Kirkham, *27th August*, 1884. G. GARTSIDE MAYOR, M.R.C.V.S.

"At the Manchester County Police Court yesterday, before Sir John Iles Mantell and Mr. W. Schofield, James Smith and Prince Derbyshire, of Harpurhey, were charged with cruelty to a horse of the last-named defendant. Inspector Gratrix, of the Royal Society for the Prevention of Cruelty to Animals, saw the horse at Blackley in charge of Smith, and on examining it, found on it two wounds such as, he said, would render the animal unfit for work. A wound on the near side of the back was 1½ inches long, and another on the off side was the size of a two-shilling-piece. The defence was that the wounds were only heat lumps, and that every precaution was taken to ease the saddle, and to prevent it bearing in the least on the wounds. A veterinary surgeon was called, and he described the wounds as mere heat lumps. They were only small, and could not have been aggravated by the work which the animal did, for the saddle was eased, and could not touch the wound.

"Sir John Mantell, in dismissing the case, said it was of the most frivolous nature. If the Royal Society, which he had the greatest respect for, condescended to take up such trivial cases, they were not doing good. People ought not to be called to answer charges of the kind before the court, and if they were so brought up, they ought to be indemnified for their loss of time in coming there. It was the firm opinion of the Bench that the case was a most frivolous one."

"PROFESSIONAL ADVERTISING."

SIR,—Professional advertising for public favour has now-a-days almost disappeared; there are still a few, however, here and there, who lower and degrade their professional status, and the status the profession is endeavouring to hold in the eyes of the public generally, by pursuing so unfortunate a course. The following, which I see has appeared in two local papers at Wrexham, is a rather extravagant specimen of the kind, and I shall be glad of your opinion thereon.—Yours, etc., "ETIQUETTE."

"A SUCCESSFUL VETERINARY SURGEON.—We are pleased to find that our well-known townsman, Mr. John Roberts, veterinary surgeon, has scored such success in his profession as to open an establishment at Smithfield House. Mr. Roberts holds high credentials. He matriculated at the Royal (Dick's) Veterinary College, Edinburgh, in 1878; graduated in April, 1881, after a most successful course of study at college; obtained two qualifications, viz., the diploma of the Royal College of Veterinary Surgeons, and the veterinary degree (now discontinued) of the Highland and Agricultural Society of Scotland, having passed five professional examinations and obtained honours at each; was a prizeman at college, and elected a Fellow of the Edinburgh Veterinary Medical Association in April, 1881. Of his success as a practitioner we need say little, it is so well known."

[We are convinced that the gentleman referred to in the above cannot have so far forgot his position, but is rather the victim of the mistaken zeal of friends.—ED.]

TO CORRESPONDENTS.

MR. PENTLAND, OF LETTERKENNY, CO. DONEGAL.—All information regarding the Army Veterinary Department will be found in the Register of Veterinary Surgeons for the present year.

M.R.C.V.S.—The second part of Fleming's "Operative Surgery" is in hand, and will be published at an early date.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from A. W. Hill, London; W. Broughton, Leeds; C. H. Huish, London; D. A. Gresswell, London; G. S. Mayor, Kirkham; R. H. Dyer, Limerick; V.S. J. Nunn, Punjab; V.S. Mills, Madras.

BOOKS AND PAMPHLETS: *A. Baranski*, Zähmung und Abstammung des Pferdes; *W. Ellenberger*, Lehrbuch der Allgemeinen Therapie der Haussaugethiere; *H. Hallopeau*, Traité Elementaire de Pathologie Générale, Comprenant la Pathogénie et la Physiologie Pathologique.

JOURNALS, ETC.: *Medical Press and Circular; Journal de Médecine Vétérinaire; Archives Vétérinaire; Revue Vétérinaire; Live Stock Journal; Edinburgh Medical Journal; Journal of Comparative Medicine and Surgery; American Veterinary Review; Il Medico Veterinaria; Der Hufschmied; L'Echo Vétérinaire; La Presse Vétérinaire; Mark Lane Express; Field; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Repertorium der Thierheilkunde; Clinica Veterinaria; Quarterly Journal of Veterinary Science in India; Recueil de Médecine Vétérinaire; Der Thierarzt; Wochenschrift für Thierheilkunde und Viehzucht; Annales de Médecine Vétérinaire; Lancet; British Medical Journal: National Live Stock Journal; Practitioner; Bulletin de la Société Royale Protectrice des Animaux de Belgique, Mai, Juin, Juillet, Aout,* 1884; *Bulletin et Mémoires de la Société Centrale de Médecine Vétérinaire, Paris, Année* 1884; *Srijks veeartsenijschool te Utrecht; Bulletin du Comité Consultatif pour les Affaires Relatives aux Epizooties, Bruxelles.*

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

NOVEMBER, 1884.

TUBERCULOUS MILK.

BY A. E. MACGILLIVRAY, M.R.C.V.S., BANFF, N.B.

THE subject is important, but almost threadbare. You cannot take up a professional *journal*, either medical, veterinary, or agricultural, but you find "*Tubercle*" staring you in the face; in one form or other it is continually engaging, and almost engrossing, the scientific mind.

Is this necessary? Is the subject worth all these researches, experiments, cultivations, etc.? The answer must be in the affirmative, for, notwithstanding the negative character of certain recent experiments, as chronicled in the pages of the September issue of the VETERINARY JOURNAL, the question is still open, and of most pressing importance, and requires more extensive, more correct, and more carefully conducted experiments than those of Dr. Francis Imlach to satisfactorily settle it either one way or the other.

In a series of experiments, such as those conducted by Dr. Imlach, correctness in every way, even to the slightest minutiæ, is absolutely necessary. I may, therefore, be pardoned for calling attention to his thermometrical observations, which, to my mind, are extremely erroneous, being in fact impossible! In the first cow experimented with, he says the rectal temperature up to within ten days of death continued at 100° F., but during the last ten days of life it rose to 101·5. In the third

cow, "the temperature never rose above from 100·5 to 101; it was doubted during life whether the cow was suffering from true Tubercle." I should rather suppose so, for although as a rule the temperature never rises very high in Tubercle, except in its very acute stages, we must bear in mind that the temperature of the first cow, as recorded by Dr. Imlach, *was actually two degrees below the natural* bovine temperature which, as every practically-experienced man knows, is 102.

These thermometrical observations are thoroughly useless and incorrect, for the good reason that they are impossible. I have made too many observations in bovine tubercular patients not to know all the phases possible in their thermometry; and I submit that Dr. Imlach's thermometry is not only impossible, but misleading.

Here were two cows in a very advanced stage of Tubercle, with their temperatures respectively 101·5 and 101; with which contrast, to quote an authority on Tubercle, the cow referred to in page 185 of Walley's "Four Bovine Scourges," where the temperature was 106·8 in a case of Tubercle; while in numerous cases which have come under my notice during the past summer, the temperature in tuberculous cows has ranged from 103·5 up to 105·5; a very common temperature being 104 F. My assistant, Mr. Charles Cowie, M.R.C.V.S., now located at Ogdensburg, New York, U.S.A., willingly corroborates these figures, having seen a good few of these cases along with me.

Dr. Imlach's reference to the comparative infrequency of Tubercle in juvenile bovines is also contradictory to fact. This, however, need not occasion surprise, when we consider the source of his information, namely, animals "slaughtered in the various abattoirs in Liverpool!" Where, in the name of wonder, is the inducement to any sane man, however grasping he may be, to send a *tuberculous calf* to a public slaughter-house? What surprises me is, that there was even one tuberculous calf (as recorded) discovered in a public abattoir! With older and larger tubercle-infested animals, the inducement to get them into *any sort* of condition for the butcher is great, and easily perceivable. No, no, Dr. Imlach, data culled from the registers of public abattoirs will not do in such an argument as this; you

must go to the dairies and farms, etc., where these youngsters are bred and reared for "future feeding or breeding purposes," to find out the truth about the ravages of Tubercle among bovine juveniles!

Dr. Imlach experimented with three calves. The first calf, he tells us, got three quarts of milk daily from 15th April to 11th May from the *first cow*. Now, we are previously told that this cow's yield of milk "gradually diminished and had almost ceased on 11th May," when she was slaughtered! Whence, then, the *three* quarts per diem to our poor calf? The other two calves got each *two quarts* of milk daily from the second and third tuberculous cows; but were otherwise liberally fed with "boiled oatmeal" and "sweet milk from a healthy cow!" These details, I fearlessly assert, render the doctor's experiments worthless. *Two quarts of milk daily!* Why, the true way to settle the question was to give milk from tuberculous cows in unlimited quantities, namely, just as much as the calves would take. This is what happens (in real bovine life) when a calf is suckled by a tuberculous cow; the juvenile draws away from nature's fountain every hour of the twenty-four.

Talk, then, about two quarts per diem; why, the mere idea is ridiculous! A calf reared away from its mother, by hand or pail, would get at least three or four quarts of milk *three times* a day.

In my opinion, the good folks at "Vienna, New York, and elsewhere," are quite right in endeavouring to stop the sale of milk from tuberculous cows; for in a recent (1884) Report of the German Imperial Board of Health, we find that the mortality from Tubercle is "great in infancy," principally, we suppose, because in infants the tubercular virus finds a decidedly favourable and accommodating nidus, where it can "run riot," and accomplish the ruin of its host in a short period. It need scarcely be observed that juveniles (whether human or bovine) are the chief consumers of milk from tuberculous as well as other cows; and considering this, need we wonder "that mortality from Tubercle is great in infancy," or that the authorities, or other parties interested, in "Vienna, New York, and elsewhere," were perfectly justified in considering it necessary to stop the *sale of milk from tuberculous cows?*

THE RELATIVE VALUE OF SUBJECTS TAUGHT THE VETERINARY STUDENT.

BY THOMAS GREAVES, F.R.C.V.S., MANCHESTER.

I DO not intend to decide in a curt or hasty manner this very important question ; although it is not my wish to embark on a controversy, it will be none the worse for being a little ventilated. It is our duty to inquire closely into it ; I am anxious to discuss it, so as to arrive at a clear, correct, and definite conclusion, with the object of improving my profession.

In commencing this subject, I assume that we are all agreed it is necessary that the student shall have a good general education, including a knowledge of French and Latin ; also that it is important he shall acquire a full knowledge of each and all the subjects now taught at college. Having arrived at this conclusion, we will, in the second place, try to concentrate our thoughts on the uses and importance of the various subjects taught, and appraise them at their actual relative value in rendering the student a useful and valuable member of society for the rest of his life. Let us try, also, to realise the relative loss he would experience in his daily life if his education was decidedly deficient in any one or other of these subjects. In continuing our examination, we may also touch upon, or drift into, a consideration of the different degrees of mental force or adaptability of the student, the various temperaments, individual idiosyncrasies, distinguishing characteristics—some of active observation, others of indolent, inactive natures—as well as of the shortcomings of the teachers, and the non-infallibility of the examiners.

The sphere of my observations in my profession extends over fifty years. During this period I have been constantly interchanging opinions with large numbers of members of my profession in the three kingdoms, on the subject of obtaining veterinary knowledge. I have had the high privilege of having discussed this subject with those learned professors, Sewell, Spooner, Simonds, Robertson, Dick, McCall, Williams, and Walley. I have endeavoured to be a close observer of human nature, have had a watchful eye upon a large number of young veterinary surgeons, the manner they conduct business, the aptitude they display, their

general bearing, their status and their character, their success and non-success in life; the successful men, I have traced the cause of their success; the non-successful, I have traced the cause of their non-success. I have seen numbers of members who possessed a good general education, also a good knowledge of the science of their profession, steady, gentlemanly men, yet not successful in their calling—complete failures. I have known other members who were possessed only of a limited education, whose knowledge of the science of their profession was very imperfect, yet who have been a success in their calling, who have gathered together large practices, and been held in high respect by all who knew them. I have known the reverse to this happen in both classes. Let us listen to the voice of reason. It is our duty to ask ourselves, "How is this? why is this?" Some of my readers may say, "Oh, it is because the one is industrious, diligent, attentive, and steady, while the other is idle, indolent, inattentive, and perhaps unsteady." This definition is sadly incomplete; I will grant you it is so in a great many cases, but not in all by any means. I want to see some principle definitely introduced to obviate this state of things, at least in some measure. There are, depend upon it, other causes in existence. I believe it is on all hands admitted that the generality of students of to-day will not compare in usefulness with those of former years; this, too, in the face of a longer college curriculum, and a larger number of teachers than was ever required before. In my long experience I cannot recall the time when there were so many complaints made about the teaching and inefficiency of the student as at the present time. It would be wise for us to put into a practical and definite shape some scheme elaborated out of the principles, characteristics, and qualifications possessed by a successful man, through the instrumentality of which he had attained that success.

It is our bounden duty to examine this subject closely, to find out where the fault lies. Is it in the system of teaching, or the system being imperfectly carried out, that is at fault? If it is, it is our duty to get it altered. Or is it the system of examination, or the system being imperfectly carried out? If it is, it is our duty to get it altered. Let us force the responsi-

bility on the right party. It will be remembered the examiners do not profess to impart any instruction to the student. We ought to centre our thoughts on this subject, and make it an all-absorbing question, until it is rectified. Let us get some definite idea of the way this is to be accomplished. Commence with correct elementary principles. Given the student be made of the right material, is diligent, industrious, and honestly determined to learn, that the teachers do their duty fully, and bestow proper care and attention in instructing him: I say the student should, under these circumstances, come before the examiners much better prepared than he does at the present time. Of necessity there would be fewer rejections and fewer failures in professional practice. Then it is for the examiner to judge of his competency. The examiner is not infallible; he is only human; he may form an incorrect opinion. The student may be inapt in his manipulation, or in his manner of answering questions, which makes an impression on the examiner unfavourable to such student, while all the time much of this is in the exterior only. In the examiner, although he may not have the eye of a magician, there must be an absence of austere, pedantic, or frivolous manners; he must assume none but a business-like air. He should be an enlightened, intelligent man—a man of mature age and experience, considerate, patient, mild, benevolent, keenly observant, and firm; one who puts his questions carefully, clearly, coolly, and kindly, so as to be fully understood; and one who weighs the answers justly, who puts the student at ease through his own apparent complaisancy. Though unseen, there is in him intentness of attention.

The standard of general education of the student has been raised. No one will for a moment dispute that this is not a step in the right direction. We know the increasing area over which modern knowledge spreads itself. It is for us to consider and decide whether the learners learn, or teachers teach a little of everything, or a great deal of some one thing. If we incline to have a great deal of some one or some few things taught, let it be those things which are *essential to our calling* (even at the expense of others less essential), which will and must make the man a useful man.

> "Not to know of things remote and subtle,
> But to know that which before us lies in daily life,
> Is the prime wisdom."

We inquire of the examiners, and they say the majority of students are very far from being well up in this knowledge of the subjects generally. We inquire of the teachers, and they say the examiners examine the students in a manner which is unfair to them; that the ordeal is not a broad, comprehensive, searching or ascertaining of the students' qualifications. We inquire from the students, and they find great fault with both teachers and examiners—the teachers for various shortcomings, and the examiners for examining in a manner and asking questions which their teaching had not fitted them to answer. There is something radically wrong somewhere, or these excuses would not be required. Now, there may be much truth in these complaints, and I maintain they should be rectified. Let us have both teaching and examining efficient, give the student no ground for excuse, and let us pass no students but those who are efficient.

(To be continued.)

THE PATHOLOGY OF A SKIN DISEASE PREVALENT AMONG TROOP-HORSES IN INDIA.

BY W. D. GUNN, M.R.C.V.S., A.V.D., KAMPTEE, INDIA.

MUCH of my time lately has been occupied in investigating the pathology of the Skin Disease which annually attacks the horses in my charge. Hitherto I have utterly failed to cure the disease. All the remedies recommended in the pharmacopœia and by veterinary surgeons I have tried without success. I, therefore, determined to make some experiments. I suspected that some special fungus was probably the exciting cause, and with this idea, I collected several fragments of scabs for microscopical examination. These were soaked in different fluids—such as water, glycerine, and acetic acid—but I could determine nothing.

On the 12th September I made a mixture of one part glycerine and four parts of liquor potassæ. Pieces of scab were de-

posited in this fluid for six hours. They were then taken out, cleaned, and, with the addition of a drop of glycerine, covered with the thin plate of glass. By the aid of a two-inch objective,

and a No. 2 eyeglass, I discovered an animal parasite which rather resembled a Tænia. The length is about $\frac{1}{8}$ of an inch, and width $\frac{1}{1300}$. The neck is $\frac{1}{3}$ of the length of the body, and scarcely half as wide. The head is composed of about twenty processes, which appear to be borers. The caudal extremity is partially truncate.

Nine other cases of Skin Disease were examined by me immediately after my discovery, and in *every* instance specimens more or less perfect (broken, probably, in teasing the mass), were to be observed.

It now will appear patent to everyone that horse-brushes are the vehicles by which the disease is propagated ; and they ought not, under any circumstances, to be changed or used indiscriminately.

Now that we know the exciting cause of the disease, the treatment will be more clearly indicated.

For the destruction of these animal parasites, I would suggest the use of sulphurous acid, or a solution of Hydrargyri Bichloridum ; the agent to be well rubbed into the parts affected with the brush.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 235.)

Having in my last short paper made a few remarks upon nasal gleet, and referred to that system of glands termed salivary, I will now proceed to describe the affections which more especially interfere with the functions of these glands, such as Strangles (Regular and Irregular), Fistulous Parotid Duct, and Glanders. But before proceeding to the consideration of them, it may be profitable to take a glimpse at the anatomical and physiological bearing of the parts. There are three pairs of salivary glands, or three single glands on either side, viz., the parotid, submaxillary, and sublingual. The parotids are the largest, and are situated near the ears, inferiorly—in fact, immediately below the root of the ear is found the superior part of the gland. It lies in the hollow space at the upper and back part of the head, and is bounded by the branch of the lower jaw anteriorly, and the petrous portion of the temporal bone posteriorly, extending as low down as the angle of the jaw. It is enveloped in cellular tissue, and is made up of many lobes. These lobes are connected together by means of a dense cellular structure. Each has a distinct set of secretory vessels ; tubuli arise from them, which at length form one main branch, the excretory duct. The parotid duct emerges from the inferior part of the gland, passes along the inner part of the angle of the jaw, and crosses over the posterior edge of the bone, just above the submaxillary artery. It pierces the buccinator obliquely, and terminates by a small eminence upon the inner surface of the membrane of the mouth, near to the second molar tooth. The submaxillary gland is much smaller than the aforenamed ; it lies in the space between the angle of the jaw, is loosely attached by cellular membrane, and is very like the parotid in structure. The termination of the duct will be found upon the *frænum linguæ*. The sublingual gland is much smaller than the last-named ; it will be seen upon the under part of the tongue. Its ducts penetrate the membrane upon the side of the *frænum linguæ*. During the mastication of the food, saliva is constantly making its way into the mouth, for the purpose of

being mixed up with it, rendering the act of chewing more easy. The secretion is formed by the three pairs of glands before mentioned. The fluid obtained from the mouth cannot, however, be said to be pure saliva, because a great deal of mucus is found with it. Saliva contains animal and saline matters, free soda and sulphocyanite of potass. The saline constituents of the saliva are nearly allied, or identical with, those of the blood. The tartar found upon the teeth is chiefly composed of the earthy phosphates, the particles being held together by animal matter.

The quantity of saliva formed during the twenty-four hours has been variously estimated. It is, I think, impossible to know what amount is secreted. It is said that a man will secrete from eighteen to twenty ounces in a day; this, however, is mere speculation. A horse produces a prodigious quantity, from the fact of his being engaged so many hours in the act of masticating his food. The flow seldom takes place when it is not wanted. When at college, a cart-horse was suffering from fistula of one parotid duct, and with a view of learning something, I held a graduated measure-glass under the fistula during the time the animal was eating a feed of oats, and something over ten ounces collected.

In "Markham's Masterpiece," one of the most ancient works on diseases of the horse, we read, under the head "Strangles":—This is "but a mean inflammation of the throat, proceeding from some choleric or bloody fluxion, which comes out of the branches of the throat veins into those parts, and there breedeth some hot inflammation, being stirred up either by some great winter cold, or taken after labour. It is a great or hard swelling between the horse's nether chaps, upon the roots of the horse's tongue, and about his throat, which swelling, if it be not prevented, will stop the horse's windpipe, and so strangle or choke him—from which effect, and none other, the name of the disease took its derivation. The signs of this disease, besides the apparent sign thereof, and the palpable feeling of the same, are, the horse's temples of his head will be hollow, and his tongue will hang out of his mouth; his head and eyes will be swollen, and the passage of the throat so stopt that he can neither eat nor drink, and his breath will be exceedingly short. The cure thereof, according to the most

ancient farriers, is, with a round, small, hot iron, to thrust a hole through the skin on both sides the wezand, and then after it beginneth to matter, to mix butter, tannen-water, and suet together and every day anoint the sore therewith, till it be whole." In writing upon "Vives," as he termed Irregular Strangles, he says :—"And the cure, according to the opinion, etc., etc., is this :—If you see the kernels begin to rankle and swell, you shall take the horse's ear, and laying it down along the neck of the horse, at the very end or tip of the ear cut a hole through the skin of the neck the length of an almond or better ; and then with a crooked wire pick out all those kernels which you find inflamed ; which done, fill the whole full of salt : then about the end of three days you shall find the sore beginneth to matter." This is about the substantial portion of the treatment adopted in those days. Coming down to the present century, Blaine, Youatt, Percivall, Hunter, D'Arboval, and others, have written nearly everything which is worthy of being recorded. There cannot be much doubt that nearly all animals are affected by this form of disease—Strangles—at some time in their lives, much in the same way as children are subject to Measles and other complaints. I also think there can be but little doubt as to its constitutional character. I will relate one or two cases which occurred in my practice, which will, I think, go some way to corroborate the opinion of those who believe it to be a constitutional affection. A yearling colt was brought to me for castration at a particular season, when many colts were lost both in this and other countries after the operation ; and I believed this one was unfit for it, as he looked unhealthy. A second was brought at the same time, of the age of two years. I objected to operate. The yearling was sent back home, and the two-year-old was left with me. The first-named was presented again in a week, when I refused, for the second time, to perform the operation. He was led home, a distance of two miles, and brought again, for the third time, at the expiration of another week. I raised the same objection. The owner felt annoyed, believing I was, as I heard afterwards, humbugging him. Up to that time I was unaware that the system of playing off tricks of this kind was practised by any person. However, the owner ordered the caretaker to apply to another

veterinary surgeon, and request he would operate, which he did at the moment, and the colt was led home. In a few hours he became ill, and died in three days, to the amazement of its owner, who, in conversation with a client of mine shortly after, described all that had transpired in reference to the colt and the objections raised by me. He then believed that there was in reality ample reason for the part taken by me, and regretted his disbelief in my judgment. The two-year-old remained in my stables for a fortnight, but remained out of sorts—not ill, but as I thought, breeding Strangles. He was taken home, and in the course of a few days the disease had fully developed into as severe an attack of Strangles as I ever witnessed. Not only were the usual symptoms present, but the skin down to the feet was covered in many parts with sores. These two cases proved beyond the shadow of a doubt the true character of Strangles. Hundreds of cases could be cited if necessary. In the course of the autumn the colt referred to was operated upon, and all was well. Most veterinarians will, doubtless, view Strangles as an affection of the entire system, assuming a febrile character, more or less severe, as the case may be, and having a tendency to the production of an abscess in the submaxillary glands. Why these glands should be more susceptible than others has not been satisfactorily demonstrated, any more than the skin eruption of Measles. I have seen several cases of Irregular Strangles in horses of mature age, and found the three pairs of glands seriously affected, especially the parotid. It need not be urged, therefore, that in pursuing our examinations as to soundness, it would be advisable, perhaps, to devote a few moments longer than we are in the habit of doing to the consideration of the appearance of the mucous membranes; but as so many animals are examined in this country—in point of fact nearly all that are purchased are examined—the owner of an animal would seem annoyed if an examiner dwelt for any length of time when looking at the nasal chamber, fearing that his horse was suspected of having some disease of which he was ignorant. I am sure that I need scarcely remark that Strangles in any form is an unsoundness.

(*To be continued.*)

"BURSATTI": RECORD OF CASES DURING 1883.

BY RICHARD WM. BURKE, M.R.C.V.S., A.V.D., INDIA.

(*Continued from page* 246.)

M. Leblanc, in *Récueil de Médecine Vétérinaire*, says: "*By combining the use of the microscope with the other means of investigation usually employed, the diagnosis of Cancer becomes comparatively certain.*" (*Récueil de Médecine Vétérinaire*, 4th series.*) M. Leblanc also states that, "Even when a tumour does not reappear after excision, one cannot affirm that the animal is cured." (*Ibid.*)

Scirrhus is a necessary concomitant of Bursatti, and where this is most marked, the cells, though they may be abundant at first, speedily disappear, and the fibrous stroma is greatly in excess, especially towards the centre of the growth, where at length no cells at all can be discovered. I would observe that the uninitiated is very apt to be misled to form hasty inferences attaching to the nature of Bursatti sores, from a habit of confining his investigations to the study of sores during certain stages only, while it is necessary to scrutinise sections of them in *all* their phases. I was frequently myself induced by a multitude of sections presenting an entirely fibromatous structure, to designate what was really cancerous as simple *fibroma;* but the sequence of similar action in the case of other sores affording sections that presented more definite cancer changes, brought me to my former conviction, that *once a cancer, now a fibroma,* is only the operation of *pressure in active growth.*

Dr. R. Mitchell, who is one of our latest writers on Cancer, says: "There is no necessary or specific form in which Cancer structure is manifested. The form of configuration depends almost exclusively on the resistance or non-resistance of the structures which surround or lie adjacent to the local manifestations." †

Again, according to Dr. Arnott, "the hardness or softness of individual cases also probably depends mainly upon rapidity of growth."

Dr. T. W. Cooke, in his treatise on Cancer, its allies and counterfeits, writes: "I would insist upon hardness as a necessary

* *Edinburgh Veterinary Review*, 1859, vol ii., p. 402.
† "Treatise on Cancer," p. 157, 1879.

concomitant in Epithelioma no less than in Scirrhus. If there be no indurated base to an ulcer, or scaly or warty growth, affecting any of the parts mentioned as most liable to this form of disease, I would reject the idea of malignancy. I have had so many opportunities of watching these growths, that I feel myself justified in giving a very strong opinion, *that without an indurated base there is no epithelial Cancer.*" *

Dr. Arnott considers "that by the terms scirrhous and medullary merely a difference in consistence should be understood." While Paget proposes to "distinguish between the different forms of Cancer only by the concurrence in them of the characters of malignant tumours"—pp. 809-10.

In conclusion, I would interpose that many phases surround the history of Bursatti, wholly irrespective of its microscopic aspects as a cancerous affection, issuing in reasons in which the most reluctant alienist must ultimately concur. Last, but not the least important, is the fact that the disease is seen to attack just those parts of the body which are commonly affected by "Epithelioma," namely, the penis, the prepuce, the eyelids, and angles of the mouth,—parts where the skin and mucous surfaces meet—and often, too, the extremities. Reference to the literature of Bursatti will prove this fact.

It has been conceded by Mr. Steel, A.V.D., who has described certain *fungi* in this disease, that "when more is known of Cancer proper, it may be found not unlike Bursatti." † The forte of this statement lies in its way of putting things, not in the things which are put. It refrains from any further consideration of the pathology of Cancer, which it would appear was also due to a "parasite." We admit that the statement is plausible, though it is inconsistent and hypothetical; for it involves the entire abolition of ascertained facts by the most eminent pathologists. Meanwhile, the clinical and historical testimony of some of our most distinguished veterinarians in the country on Bursatti, is found to tally in description with that of medical writers on Cancer as it affects man.

* Mr. Oliphant gives a graphic description of the course and termination of a Bursatti sore, in a paper contributed to the VETERINARY JOURNAL, vol. xi., 1880, pp. 18 and 19.

† VETERINARY JOURNAL, Oct. 1881, p. 241.

Bursatti Cell Concretions.—"*Kunkur.*"*—In regard to this disease—"Bursatti"—I have now conclusively shown, I think, that it is Cancer. What a great many readers, however, will not be able to grasp at first sight, is as to how the peculiar little bodies called "*kunkurs*" are formed and developed. With regard to the human skin, which is analogous in general respects to the equine, we are aware of the existence of the upper and lower skin, one cellular, the other more compact. In it, as the effete cells are shed, further cells are developed in regular order. And if a certain normal stimulus be applied to this epidermis, the cells will form perfectly regular, level skin. But should an abnormal stimulus be applied interfering with the regularity in the occurrence of ordinary phenomena, they will, on the contrary, be prone to take a disorderly course, and present an irregular, rounded, or onion-shaped appearance. And this presentment of the cells is, as we know, a peculiar characteristic of Cancer growth. A deposition of calcareous matter now takes place in these cells, and their aggregate contour is thereby rendered conspicuous. This may be described as practically the formation of "*kunkur*," from its inception to the period of its ultimate formation. Mr. Abernethy has described similar bodies in the disease termed by him "Tuberculous Cancer" of man.† He says: "In some instances portions of the scirrhous mass are converted into a hard substance resembling cartilage, in which bony or calcareous degenerations are occasionally found."

Professor Volkmann,‡ speaking of Lupus associated with canchroid, describes the appearance under the microscope of almost identical bodies—"bulbous formations made up of horny, laminated, epidermis cells, which are harder than is ever met with in Lupus"—resulting from a "copious aggregation of small exuberant cells; and the elements of the cutis, and not unfrequently, of the still deeper seated layers of cellular tissue, are completely displaced and destroyed by them."

* These nodosities, met with in the sores and internal organs of horses suffering from Bursatti, have been called by the *salootrie* "*Kunkur*," which reflects more or less the sort of idea prevailing with this class of men relative to the morphology and general composition of these disease products.

† Hooper's "Medical Dictionary."

‡ "German Clinical Lectures," New Sydenham Society, p. 102. 1876.

Nodules, however, are of various kinds. There are those due to the *bacterium* described by Koch in the disease known as Tuberculosis; others due to the *Strongylus vasorum* of Baillet, which gives rise to the *tuberculous miliary aneurism* studied by Kiener; others produced by the action of another order of parasites, the *actinomyces* in the morbid condition termed Actinomycosis or Rivolta's disease; others caused by the irritation of certain *helminths*, as described by Professor Colin, of the Alfort Veterinary School; others dependent on the action of *micro-organisms* described by MM. Christal and Kiener, in Glanders; lesions due to Pyæmia, to Strangles, and to Catarrhal Pneumonia, which has become chronic by caseating, etc.; as well as echinococcus cysts and other lesions caused by foreign bodies and mechanical and chemical irritants, which have become encysted and undergone caseous or calcareous degeneration in organs, might also be confounded with any of the above. We mention the foregoing, because we know of writers who pretend as to the presence of *kunkurs* in internal organs being general to horses in India, having nothing in common with the nature of Bursatti.

The nodule in every instance is only the expression of an irritant, simple or specific. In contagious disease, apart from the physical character of the nodule, it is characterised by inoculable properties, *i.e.*, of its tendency to produce similar nodules by inoculation of a healthy, but properly constituted animal. That is the great diagnostic criterion of a contagious nodule.

The irritant which produces the Bursatti nodule in remote parts is merely a tissue irritant derived from the external sore, and acts embolically; the caseation that sometimes follows is a mishap due to insufficient blood supply; while the later change of calcification is due to infiltration of this structure with inorganic salts. In regard to the caseation of Bursatti nodules, that can only take place as a result of complicity with other products and from insufficient nutriment; which accounts for the infrequency with which *yellow* nodules are here found to exist, and in this respect the disease differs in an important particular from Tuberculosis. It is commoner to meet with the grey formations, and those which have undergone that physical variation by

transformation into a horny mass, called cornification, or by infiltration with inorganic salts into *womb-stones* or "*kunkur;*" whilst those situated under capsules of organs are usually umbilicated, or slightly depressed in their centre. This appearance is very characteristic in cases of secondary Bursatti, when the disease has reached the internal organs, which I have from the first maintained that this actually happens in most cases. We were almost the first, so far as the literature of the subject shows, to consider the *pathological anatomy* of this affection in a paper contributed to the VETERINARY JOURNAL, vol. xiv., 1882.

It may be stated, generally, that the physical characters of more or less all the nodular formations in the lungs and other internal organs depend for the most part upon their development, period of maturity, and complicity with secondary results. But the grey nodule, in the case of Tuberculosis at least, according to most authorities, "regularly undergoes the caseous metamorphosis and subsequent *softening;*" so that it is necessary to bear in mind this frequent change, and to recollect that young tubercle comports itself differently from older tubercle, that the former is viable and living, the latter often only detritus and disorganisation. Dr. Arthur Wyne Foot* says: "Virchow's teaching that all cheesy matter is not tubercular has, from the preponderating influence of such a master, been since pushed to so dangerous an extreme, that many are even disposed to doubt the tubercular nature of any caseous matter; whereas, on the contrary, tubercle is one of the most frequent, although not the sole cause of such productions in the body."

Dr. Bennett† says: "Like tubercular deposits, Cancer may be infiltrated through all the tissues, but usually it maintains the character of isolated masses, pressing on and pushing aside the surrounding textures without invading them."

Dr. Mitchell, in speaking of the absence of inflammation in Cancer, says that it is characteristic of that disease for it to occasion *no* suppuration until a very late stage, and even seldom then ("Treatise on Cancer," p. 83).

* "Lecture on Tuberculosis," by Dr. Arthur Wyne Foot, Senior Physician to the Meath Hospital and County of Dublin Infirmary.

† *British Medical Journal*, May 28th, p. 541, 1870.

Principal Veterinary Surgeon George A. Oliphant, in describing the nature of *kunkur* found in Bursatti, says: "It appears to consist of animal matter, containing deposits of salts; when fresh it cuts like cartilage, and when dried is distinctly gritty. *In all these points it is very like tubercle, but I have failed, so far, to trace in it one peculiarity of that diseased product—softening*" (VETERINARY JOURNAL, vol. xi., 1880).

The presence of inflammation in tubercle and its absence in "Bursatti" indicate the great distinction between the two diseases.

Hunter writes: "The Cancer, although it produces a secretion, yet does not produce pus till exposed; it does not suppurate till inflammation comes on, and even seldom then, for true suppuration arises from inflammation, terminating in a disposition to heal, which is not the case with Cancer" ("On the Blood," p. 493, 1828).

Dr. Stokes considers "that the origin of Cancer is not to be attributed to any inflammatory process. The disease did not produce irritative changes in surrounding structures, but was a process of *conversion*" (*British Medical Journal*, April 8th, 1871, p. 381). And the causes of this were explained by Van der Kolk,* as early as 1847, in his admirable work "On the Formation and Extension of Cancer Cells in the Neighbourhood of Cancer, and their Importance to the Performance of an Operation."

In the rapid disease process these bodies—"*kunkurs*"—are sometimes found embedded beneath the skin. To the natural query of how this happens, let us take, for instance, the case of the disease having affected the skin of the fetlock. As it eats into the deeper structures it forms a cavity, and the healthy adjacent skin in its growth will naturally overlap this cavity, the disease scooping itself in under the edges. Dr. S. Fenwick, writing "On Atrophy of Stomach as a Result of Cancer," says:† "I have seen it most developed where the tumour of the mamma was of a hard, fibrous character, slow of growth, and where eventually *small nodules formed in the skin.*"

(*To be continued.*)

* *British and Foreign Medico-Chirurgical Review*, No. 30, April, 1855.

† *Retrospect of Medicine*, July to December, p. 108, 1877.

Editorial.

THE PRACTICAL EDUCATION OF STUDENTS AND VETERINARY SURGEONS.

In our last number we remarked that we had pressing reasons for earnestly wishing to raise the general standard of professional knowledge of those who present themselves for admission to the Royal College of Veterinary Surgeons. We now desire to invite special consideration to the practical education of the candidate, and to urge that there is the greatest need for reform. It is a fitting time to do so, as a new session has just begun at our colleges, and students, both medical and veterinary, have listened to valuable introductory addresses, containing much good and salutary advice. Our object in writing this article is to impress upon all concerned how great a necessity there is for *more practical knowledge*. No one who has anything to do with the examination of young veterinary surgeons can fail to be struck with the deplorable want of acquaintance shown by the great majority with the practical rudiments of their profession. We, therefore, submit that all our final examinations, on the matters we are about to discuss, should be made much more thorough and searching than has hitherto been the case. It surely is not too much to ask that, before a candidate obtains his diploma, he shall be able to point out in the living horse such common things as the "withers," the "loins," the "croup," the "point of the shoulder," the "hip," the "pastern," the "fetlock," and various other parts of the body. It is, however, our constant experience that one young veterinary surgeon after another appears, who is quite unacquainted with several of these common and elementary terms. It is not too much to demand, that a newly-made veterinary surgeon shall be able to apply to the different parts of the foot the common terms which are generally employed by the smith, so as to be able to give intelligible orders or instruction, and that he should also know the names of the shoeing tools, and of the different parts of the shoe. It is high time that young veterinary surgeons should cease to regard the nasal orifice of the lachrymal duct as a glanderous ulcer, and, therefore, complacently say that they would advise the horse to be destroyed. This mistake sounds almost incredible, yet it is of sufficiently common occurrence, and, if the animal be at the same time suffering from a catarrhal discharge, his doom is sealed. We heard a clever veterinary surgeon remark, in discussing this error, that it was a very severe measure to destroy the poor horse for possessing a lachrymal duct. It is not too much to expect that the young veterinary surgeon should understand how to "pick up a horse's foot," and that he should generally know how to "go about a horse," or other patient, in a proper manner, and consequently with the least amount of danger to himself. If he is ignorant of these things he should on no account receive a diploma to practise. All owners of stock and their attendants can see whether the practitioner is familiar with these necessary matters, and if he is not so, he excites ridicule, and cannot hope to succeed in his avocation. Furthermore, he

brings discredit on his teachers as well as on his diploma. But where veterinary surgeons—young and old—are most exposed to the scrutiny and criticism of onlookers is in the examining of horses for soundness, a professional duty and high trust of the very greatest importance. Here it is quite common for scores and hundreds, nay thousands, of pounds to depend on the capacity of the examiner. Any one acquainted with horses can see, after the first few moments, whether the veterinary surgeon is fit to be trusted to examine a horse for soundness. If he goes about it in a weak and undecided way—first looking at one leg, then changing to some distant part of the body, perhaps on the opposite side, then suddenly returning to where he first started, and so on, in an apparently aimless manner—he is a failure. Those, however, who have observed many young veterinary surgeons examine horses will admit that the picture we have just sketched is in no wise overdrawn, and that it is true of at least four out of every ten examples taken at hazard. Is not this a very lamentable state of affairs? and should it be suffered to continue? If a would-be veterinary surgeon examines a horse in the manner we have just described—although, after much loss of time and indecision, he may at last stumble on a right conclusion—he should not receive his diploma unless he can perform this most important duty in a regular and systematic way. Let any one observe a good and successful practitioner, who is accustomed to examine many horses, and he will find his method such, that if a mistake be made, it will arise, not because he omitted to do anything, but from his failing to detect the fault, although he actually looked for it. If a veterinary surgeon examines a horse in any other way than this, he may be quite certain that he has still much to learn. We would suggest that at all the colleges the senior students should be well instructed and frequently tested in what we have just mentioned. Many a veterinary surgeon has made his mark through being able to examine horses for soundness in an efficient and satisfactory manner; many a practitioner meets his ruin through ignorance of it. All candidates for a diploma should be able to speak with confidence as to which leg of a horse is lame, and yet we constantly see mistakes made in this respect. Let us briefly refer to operations. How false is the position of the young veterinary surgeon who is ignorant of the usual and common ones, and of the different methods of casting horses and other patients, and securing them. This ought not to be, but it will occur so long as students merely look on, and are not often compelled to do these things over and over again with their own hands, and until they are *perfectly familiar with them.* A false pride is the cause of most of the ignorance we are now considering. For fear of ridicule students will not ask for information on what they imagine others will think they ought to know. It may embolden these diffident ones to learn that the very students at the colleges who pretend to most practical knowledge are frequently, when tested, found to be the most ignorant, and in want of instruction. Does not all this seem to favour the suggestion which we now make to teachers and students, that the latter should spend much of their leisure time, while on the college premises, between lectures, in showing each other practical things. Why should not the most earnest students form voluntary classes for mutual practical

instruction? All are much in need of it, and they who fancy they can learn by only looking on are woefully mistaken. What we consider desirable is that all would-be candidates for a diploma should be at least well acquainted with what every bystander can criticise, and that, if ignorant in these matters, they should on no account be admitted as members of the Royal College of Veterinary Surgeons. We beg earnestly to commend to all who are responsible—however little—for any pupil's education that these necessary practical matters demand unceasing vigilance and attention. It is most unjust to the student to allow him to evade learning the practical rudiments of his profession, and it is still more unjust to the public to give a diploma to one who is not familiarly acquainted with what we have here noticed. We may add that we are by no means of those who believe that our professional and practical education has deteriorated; on the contrary, we consider that during the last ten years it has much improved. But we cannot, and ought not, to suffer such common failings as we have now mentioned to pass without protest. In conclusion, we would say to all students, "Diligently work to make yourself master of what we have named in this article; if you do not, you will bitterly regret it when you have to rely upon your own knowledge and exertions to fight the great battle of life." There is more to be said on this subject of practical education, and we shall refer to it on a future occasion.

THE BREEDING AND CLASSIFICATION OF CLYDESDALES.

BY PROFESSOR WALLEY, M.R.C.V.S, EDINBURGH.

My attention having, in various ways, been recently drawn to the above subject, I take the liberty of making a few remarks in reference to it. At the outset, I wish it to be distinctly understood that I have not written the following lines from any interested motives. I have nothing whatever to do with Clydesdales pecuniarily, but I must confess I am a great admirer of them; nor do I expect that my ideas will find favour in every quarter, but I claim, as I give to others, the right of entertaining my own opinion.

So far as I can gather, one of the great objects of breeders in the past has been to obtain horses with plenty of hair on their legs—"well feathered," in other terms; and I would ask at once, of what benefit is this superabundant growth of hair on the lower part of the extremities? If horses were, like Cochin-China fowls or pouter pigeons, required for no more important purpose than to strut about in a dignified manner and to please the eye of their owners, I could understand the anxiety of some breeders to increase—even by questionable artificial means—the quantity of this hirsute appendage; but seeing that horses are intended to subserve a useful purpose, I fail to see wherein they are advantaged by the possession of a plentiful supply thereof on the posterior aspect of their limbs. Indeed, considering the great disadvantages its possession entails upon animals in hard work and in dirty weather, I marvel that men can be found to advocate its production. That a large quantity of hair on the legs improves the appearance of an animal I have yet to learn; and if this were the case, how is it that the absence thereof in the legs of light horses is accepted as a mark of beauty and a sign of good breeding? A profusion of hair presupposes a coarse skin, and a coarse skin means a corresponding decrease in vitality, and consequently a greater

liability to diseases of malnutrition—such as grease, thick legs, and cracked heels. It further means a more highly lymphatic constitution, and as a consequence a greater tendency to such affections as Weed. Bushy hair is also a splendid harbourer of dirt, and an effectual screener of laziness; moreover, being very retentive of moisture, it predisposes to sloughs and hacks of the pasterns and coronets, and leads to excessive irritation and itching.

Another great point aimed at by some breeders, is the production of *plenty of bone*. This in itself is laudable enough, but I would suggest that if a little more attention was given to *quality of bone*, a greater and more valuable desideratum would be obtained than can ever be got by mere quantity. In comparison, the small bones of the thoroughbred are, in strength, as two to one of the ordinary cart-horse. Quality of texture—not excess of texture—is required, and I would prefer the Cleveland bay, with his flat shanks and cannons, before the round-boned heavy cart-horse we so frequently meet with, for fatiguing and straining work. A broad, flat cannon-bone is usually associated with well-developed tendons, the whole measuring between five and six inches in width. The round cannon, on the contrary, is associated with ill-developed tendons and ligaments, and rarely exceeds four or four and a half inches in width. The former will stand any reasonable strain on the tendons; the latter is a prolific source of contracted and straightened limbs. In conjunction with such conditions as these, we want, what are frequently overlooked, big joints and well-developed muscles. If we have the former, we get freedom and elasticity of motion, with plenty of room for attachment of the more active agents of locomotion; and if a horse possesses the latter, he possesses the means of co-ordinating the movements of his limbs, and is thus less liable to suffer from ligamentous, tendinous, and joint lesions. If greater care were exercised in the production of *big arms and big thighs*, we should see fewer "calf-kneed" and "sickle-hocked" brutes than we now do, and "knuckling-over at the fetlocks" would be a rare deformity.

In regard to the shape of the pasterns, opinions seem to differ very widely, some minds favouring a comparatively straight, and consequently short pastern; others a very oblique, and consequently a long pastern. In both extremes there is danger, and in every case a happy medium should be aimed at. If the pastern is straight and short, it favours concussion and the production of ring-bone and side-bone, and predisposes to strain of the "check" ligaments at the back of and below the hocks and knees: while opposite extremes most certainly do not, as a rule, add to the strength and traction power of the limbs. Personally, however, I prefer the latter extreme.

Other points which add to the traction power of an animal—and that by virtue of affording space for attachment of muscles, as well as by increasing leverage—are well developed *leverage bones*, such as the ilium (point of hip), the olecranon (point of elbow), and the calcis (point of hock or nap); and well-developed *floating bones*, as the patella (stifle cap), the trapezium at the back of the knee, and the sesamoids at the back of the fetlock. In the Clydesdale some of the bones mentioned are conspicuously short, and most notably so in the case of the calces, the shortening leading to great prominence of the flexor tendons, which gives to the hock the appearance of being the subject of Thorough-pin, a disease to which such hocks, in my experience, are not particularly prone, though they are frequently, from their narrow formation, affected with bone-spavin.

In the estimation of some judges, I am afraid, gross condition counts for more than do good points; and I suspect that many a horse which appears, in our showyards as a "splendid creature," would be only of use for the purpose of a "clothes horse," if reduced in condition to the level of a working animal; and this abuse and absurdity will continue, to the disadvantage of

the horse, until those interested begin to recognise that "fat is not power," and that "it hides a multitude of sins of conformation."

Excess of fat and a forced condition predispose to disease, especially of the liver, and give an animal a poor chance of battling against adversity when it comes upon him, and in the case of mares (as of cows or ewes) is very apt to interfere with impregnation and the nutrition of the fœtus. Not only does high condition swamp sins of conformation, and tend to produce sterility, but it more seriously, and very largely, distracts the attention of judges from the *one point of importance* in connection with breeding animals, viz., *soundness.*

If there is one thing which has caused me more amazement than another in connection with the awarding of prizes to Clydesdales, it is the utter neglect of all ordinary precautions to ensure that the prize is given to animals of resonably sound constitution. In the ring, horses are often kept on the short leet with constitutional defects so glaring that even the veriest novice in veterinary science would detect them in a moment, and order the horse's groom to "to stand aside" with him ; but the judges in their wisdom prefer to give such animals "a chance," and not infrequently are ultimately persuaded to "give them a place" too, on the principle, I suppose, that they "improve on acquaintance."

I have said elsewhere, and I repeat it here, that this neglect of ordinary precautions to ensure that prize winners may be entrusted with the important function of begetting sound animals, is likely to be the rift in the lute of the Clydesdale breeder which will spoil its melody ; and so long as agricultural societies fail to recognise the important fact that it is their duty to protect the breeding public from the danger to which I refer, and so long as they allow their stamp of approval to be put upon brutes unfit for any other purpose save that of being deprived of the power of propagating their species, and ending their lives between the shafts of a cart or in the plough, so long will the evil be perpetuated. If animals were only bred for the purpose of turning them over at two and three years old to outside purchasers with more money than brains, the system of breeding from unsound animals could not be productive of any material harm ; but seeing that in *the long run the profit of the breeder must come from the consumers, i.e.*, from those who require horses for *utility* only, the utter carelessness so largely shown in reference to unsoundness is rapidly bringing on "a day of reckoning" for breeders of this class. It is all very well for a man to say, when he has his horse on his own farm, "Oh, it's only a bit side-bone ;" or, "his hock is just a wee bit puffed." But the "bit side-bone," and the "wee bit puff" are very frequently a curse to the owners of town horses, and the farmer and contractor alike forget that what may be a minor defect on land becomes a major defect on the streets.

I must most emphatically declare that, in my opinion. no animal, be he Clydesdale or any other breed, should be awarded a prize as a stock-producer if he has the slightest trace of constitutional disease about him, and that every batch of judges should not only be accompanied in the ring by an attending member, but by a skilled veterinarian—or two, more preferably—in large shows. The attempts made by some judges to combine the functions of veterinary surgeon and judge are certainly most amusing to the professional onlooker ; and the tailor-like fashion in which some of them pretend to examine the limbs of the animals they are judging is not calculated to give horsemen a very favourable impression of their veterinary skill.

In the matter of classification it seems to me that the system at present pursued has something strangely anomalous about it. Why should the Clydesdale of elephantine proportions be placed alongside the horse of comparatively pony-like proportions ? Are they not required for two distinct purposes ? While the latter would be helpless in dealing with a four or six ton log of timber, or with a lorry load of three or four tons weight, the former

would, by his lumbering movements, wear himself out in a short time if put in to plough soft or yielding land. Weight should be placed as a counteracting force to weight, and activity be kept for work where activity is of more importance than power. Moreover, it is unfair to both classes to place them in juxtaposition with each other, for their chances of taking a prize in a showyard will most certainly depend to a very large extent upon the proclivities of the judge; if he be a heavy-weight man the heavy weight will win, while if he be a light-weight man the heavy horse stands but a poor chance against his lighter neighbour, no matter how much superior he may be in other respects. The truth of the comparison I have drawn never received stronger confirmation than at the Centenary Show, where, in the class of two year-olds, an elephant, comparatively, was chosen to "stand in" for the money prizes alongside comparative pigmies; and the same anomaly was seen also in some of the other classes. Is there, may I ask, any reason why two distinct classes of Clydesdales should not be instituted, viz, an *agricultural and cart class* and a *heavy trade and lorry class?* Of the heavy class of horses for town purposes there is, it seems to me, a strange dearth at the present time; indeed, they are scarcely to be got for money. Doubtless this can be explained to a large extent on the hypothesis that every colt which promises to develop into anything like a horse is left entire, and after he has attained maturity, his owner grudges to render him useful and valuable as a gelding, no matter how unsuited he may be for the purposes of procreation, and does all in his power to sell him for a long price as a stock-getter; his efforts in this direction—by the aid of pedigree, trimming, and fat—being frequently crowned with success. I am strongly of opinion that every animal which, at the age of eighteen months or two years, shows a lack of those points which go to make a valuable sire, should be castrated, the comparative risk in castration between a yearling and a two-year-old being by no means so great as is generally supposed, and even if it did involve a greater risk, this would be more than counterbalanced by the increase in stamina and development which would ensue from leaving the animal for a longer period in its natural state.

I know that an objection is sometimes entertained against the breeding of big horses from their, theoretically, greater liability to become roarers, and to develop side-bones, etc.; but this objection would not in any sense be valid, if strict attention were paid to soundness and conformation. In speaking of big horses, I do not necessarily refer to mere height, but rather to a well-developed, bony frame-work, with plenty of room for the respiratory, circulatory, and digestive organs; plenty of muscle, good shoulders, haunches, arms, and thighs; big joints, and short shanks and cannons, and good, open feet. The animal that is required for heavy town work can be described in the single sentence—"a mountain in a mole heap." We don't want long-legged, narrow-chested, flat-barrelled animals, with long thin necks and head set on at an acute angle. They are neither useful nor ornamental, but are deficient in constitutional stamina, and, as a rule, are the first to fall victims to enzootic and epizootic affections, and the first to succumb to serious sporadic maladies. For town work, big horses are required, not only on account of the great weights that have to be drawn, but also on the score of economy. With rates of cartage as low as it is possible for them to be fixed, and with the present high price of labour, one horse requires to be strong enough to do the work of two before a reasonable profit can be obtained; and if our breeders neglect to provide such animals, they must expect to see the Shire horse replace the Clydesdale; and not only so, but when the day comes, as it most assuredly will, that the present foreign demand slackens, they must expect to have a large number of animals left on their hands, to be sold at remunerative prices. The best customer of the breeder and trader, in my opinion, is the steady and certain consumer.

THE OUTBREAK OF CATARRH AMONG SHEEP IN QUEENSLAND.

THE CHIEF INSPECTOR OF STOCK *to* THE UNDER COLONIAL SECRETARY.

Office of Chief Inspector of Stock,
Brisbane, *1st August*, 1884.

SIR,—I have the honour to report, for the information of the Honourable the Colonial Secretary, that on the 19th July last, Inspector Roebuck, of Wide Bay and Burnett Districts, reported to me that a bad case of Catarrh had appeared at Degilbo Station, in a flock of 8,000 travelling sheep, the property of the Hon. James Taylor, of Cecil Plains.

Although I had every confidence in the knowledge and judgment of the Inspector, who is one of the most experienced officers on the staff, and has a good practical knowledge of this particular disease, I deemed it my duty to proceed to the district and make inquiries into all the surroundings of the occurrence.

I arrived at Degilbo on the morning of the 25th, and found the sheep (a flock of strong young wethers) on camp, with over a hundred lying dead, many in the last agonies of death, and, according to the estimate of the Inspector, over forty per cent. of the whole flock in various stages of the disease known as Catarrh.

The death-rate at that time was, and for several days previously, I was informed, had been over two hundred daily; and the total number of deaths up to that date over seventeen hundred. The symptoms are the most clearly defined of any previous case of *nasal*, as contradistinguished from *pulmonary* Catarrh, within my somewhat extensive personal experience of the disease.

All the organs were perfectly healthy. The lungs, liver, pleura, etc., and the alimentary canal throughout its entire length, were in a perfectly natural condition; and it was only in the respiratory passages of the head and throat—from the nose along the bronchial tubes—that the effects of the disease were seen. There, however, they were most pronounced and unmistakable, the lining membranes being totally destroyed by severe inflammation. In most instances there was a copious discharge from the nose; but in a few cases this was not extensive. In all cases where the nasal discharge was slight, the Inspector and those in charge of the sheep observed that the brain was affected. The animals would frequently throw up their heads and suddenly spring upwards on their hind legs, with other symptoms which the shepherds descriptively term *crankiness*. These symptoms are exactly in accord with those described by Dr. Bennett and other professional gentlemen who, at the instance of the New South Wales Government, made a searching inquiry into the first outbreak of Catarrh in Australia in 1834, and they are also in keeping with my own practical experience of the disease, particularly during an outbreak of it in my own flocks on the Murray, in 1856, when my losses amounted to 5000 sheep in the short space of three weeks.

It is worthy of remark that the first outbreak of Catarrh appeared during a winter following on a severe droughty summer, and this has generally been the case with subsequent outbreaks, except when they have occurred from actual contagion, when the disease not unfrequently appeared in summer. My first experience of it in Victoria, in 1854, was in the month of February; but that was an undoubted result of contagion from infected sheep travelled from the high lands of Monaro, and infecting all the sheep with which they came in contact on their route. In such cases it rapidly disappears when the sheep have access to burnt feed or young succulent grass.

In districts which may be considered its habitat, such as Monaro in New South Wales, and portions of the Upper Burnett of this colony—in both of which it lingered for years—the annual losses were comparatively trifling.

I have dwelt at greater length on a description of the symptoms and *post-mortem* appearances of the disease than may appear necessary in a Report like this or to those to whom the disease is familiar ; but I have deemed it well to do so because, fortunately, instances of it are now so rare that few of our present sheepowners have seen it, and I find that its nature is little if at all understood by a large majority. Many appear to be under the impression that Catarrh in sheep is simply a violent cold. To some extent the name is misleading. Catarrh proper is an endemic disease, similar to the disease of that name developed in the horse, and even in the human subject, by no means fatal, and by many considered neither infectious nor contagious. The disease under notice, however, is a highly malignant febrile disease, very fatal and contagious, and is more correctly described by the term originally applied to it by medical men and veterinary surgeons—namely, *Catarrhal fever*.

So far, no cure of general application has been discovered for this disease.

The sheep left Cecil Plains on the 8th of June, and travelled by way of Nanango, Barambah, Bonara, and Kilkivan, and it is evident from their condition that they have been carefully driven.

The first appearance of the disease occurred on 4th July, two days' stage from the Kilkivan head station, when two sheep were found dead on camp in the morning, and the death-rate increased until at the time of my first seeing the sheep it had reached between three and four per cent. daily. On the last occasion of my visiting the flock—on the evening of the 29th—3,000 had succumbed, equal to a loss of $37\frac{1}{2}$ per cent. of the whole flock. From this it will be readily understood that the attack is of a most alarming character.

It would be idle, at the present stage of inquiry, to speculate as to whether this outbreak is the result of contagion, heredity, or constitutional predisposition, or whether it is a case of spontaneous development.

Hitherto its appearance has been traced to one or other of the two first-named causes, and the measures adopted for so successfully stamping it out were founded on a knowledge of that fact. Catarrh has never been known in the Cecil Plains flocks, and therefore it cannot be traced to heredity. Neither have we the slightest reason to attribute it to constitutional predisposition. When it has appeared spontaneously in sheep hereditarily predisposed to it two never-failing *post-mortem* appearances are present :—The stomach is impacted with undigested food, and there is an unusual accumulation of fæcal matter in the intestines. Neither of these symptoms is present in this instance, and therefore, according to all previous experience of the disease, the present outbreak has all the appearance of having resulted from contagion.

Our first duty after isolating the infected flock, was to ascertain whether any other sheep had travelled over the same ground since the development of the same first symptoms, as large numbers had been and were then travelling in the Wide Bay and Burnett Districts in consequence of the drought.

So far, from all we have been able to learn, only one flock of about 10,000, belonging to Eton Vale Run, had touched the route after the disease had become patent. This flock not only crossed the track, but actually camped on a portion of it, after the drover had been cautioned as to the danger he would incur in so doing. I therefore directed that the sheep be placed in quarantine on Doondul Run, where they were at the time, and where they will remain until the Inspector and Sheep Directors are thoroughly satisfied that their release will not incur any danger. The route along which the infected sheep travelled from Kilkivan, as well as that portion of the Maryborough and Gayndah road intersecting the infected country, has been closed to all sheep traffic, and as the Act provides that all those lands must remain in quarantine for at least six months, I have every reason to hope that the spread of the disease has been completely checked. Previous experience on this point has shown that the contagium of Catarrh is dissipated, or at least rendered innocuous, by a heavy rainfall.

Two of the sheep directors of the district, Messrs. Eaton and Rose inspected the flock, and the latter, with the Inspector, Mr. Roebuck, issued the necessary order to destroy. The destruction is being carried out as expeditiously as is possible with the limited amount of labour available.

The directors were of my opinion that, under Section 29 of the Act, they had no option but to order the destruction of the flock ; but as this is the first instance of disease appearing in travelling sheep, I deemed it advisable to proceed to Gayndah and obtain, by wire, the opinion of the Minister on the question, so that until receipt of your reply the destruction was confined to such of the sheep as were beyond all hope of recovery.

Under the circumstances, I consider the destruction of the whole flock by fire necessary for the safety of the other sheep in the colony, as sheep that have once developed symptoms of Catarrh are liable to subsequent attacks, and if this flock had been permitted to be removed to the centre of a sheep district the consequences might ultimately have been very serious.

I regret that, through the absence of facilities, the sheep could not be boiled down. Even if facilities had existed at Maryborough, as formerly, the risk of travelling them to the ports would have been much greater than the small saving to the sheep fund would have justified.

The gentleman in charge of the sheep, Mr. Bolton, has given us every assistance within his power in tracing the extent of the infection, and the Directors, the Inspector, and myself, are under a strong sense of obligation to Mr. Hooper, the manager of Degilbo Station, for the many facilities he has offered and the valuable assistance he has rendered throughout.

The inspector has placed a gentleman in charge of the sheep for a few days to admit of his inspecting the various runs through which the flock has travelled, and will place any sheep or land of which there is proof of contact with the infected flock, in quarantine, and give due publicity of the fact in the newspapers circulating in the district.

I have instructed the Darling Downs Inspector to proceed at once to Degilbo, and make himself acquainted with the symptoms of the disease, so that he may keep up a strict inspection of all the Downs flocks, portions of which have been recently travelled in the Wide Bay and Burnett Districts. I have, etc., P. R. GORDON, Chief Inspector of Stock.

BURSÆ MUCOSÆ.*

BY PROFESSOR F. EICHBAUM, OF GIESSEN.

THE ANATOMY AND HISTOLOGY OF THE MUCOUS SACS AND TENDON SHEATHS OF HORSES.

ON all those parts of the body where muscles, tendons, and skin play over bony protuberances, we find a membranous sac filled with a small quantity of slippery fluid. These sacs receive various names according to their situation ; those under muscle and skin are called "mucous sacs" (Schleimbeutel), or *Bursæ mucosæ ;* those under or surrounding tendons "mucous sheaths" or "tendon sheaths" (Scherenscheiden) *Bursæ mucosæ vaginalis*, sine *Vaginæ tendinum mucosæ*, s. *synoviales.* The function of these structures is the same in either situation—viz., to facilitate the gliding action of skin, muscle, and tendons over any hard substance beneath them, in order to prevent friction and tearing of the soft tissues. Mucous sacs and tendon sheaths not only resemble each other in their physiological function, but also in the ana-

* Translated from the "Archiv fur Wissenschaftliche und Practische Thierheilkunde," Bd. ix., Heft 1 and 2, by G. A. Banham, F.R.C.V.S.

tomical structure of their walls, and the fluid they contain. They differ, however, in form and situation; for instance, *Bursæ mucosæ* are generally round or oval sacs, situated on one side only of the muscle or tendon to which it is attached, whilst *Bursæ mucosæ vaginalis* are cylindrical sacs surrounding tendons which pass through their centres. Variations of this latter form are frequently observed; the sheath may only be on one side of the tendon and may be united to it, so as to form a long mucous sac or sheath-like bursæ—*Bursæ vaginalis.* When the structures are studied more closely, we find there are histological and morphological differences and peculiarities which require special attention.

In surgery, it is important that a knowledge of these structures should be obtained. They frequently suffer from the effects of bruises or wounds, which give rise to acute or chronic inflammation accompanied or followed by functional disturbances (lameness, etc.) or a chronic accumulation of the unnaturally large amount of fluid in the sac (Hygroma), causing deformities of the part. As examples of these may be mentioned—diseases (or injuries) of the tendinous sheaths of the extremities of horses, the subcutaneous bursæ on the Processus anconæus or P calcaneus, the bursæ under the insertion part of the cordiform part of the Ligamentum nuchæ to the occiput (Blain), to disease of the bursæ under the medial insertion branch of the M. tibialis anticus (Flexor metatarsi) (Dickerhoff) on the internal part of the hock, and the Bursæ podotrochlearis (Branell) between the navicular bone and the perforans tendon. Finally, the fact that some of the bursæ or tendon sheaths of horses communicate with the joint proper, and that alterations in the one, as a rule, give rise to disease in the other, suffices to show how important it is that the operating surgeon should be familiar with them.

These structures are, as will be seen below, not at all constant. Age, constitution, use, or particular kinds of work, etc., all play a part in producing deviations in their presence, size, and shape, and especially is this the case with the Bursæ mucosæ under the various parts of the skin. We have endeavoured—after several years' continuous study—to tabulate the presence of these structures on the various parts of the body. Before we describe them, however, we will first look at their anatomy and histological structure.

In the following description of our investigation, some of the Bursæ mucosæ which may occasionally be found in the body may have been omitted, yet we trust our readers will find sufficient material to judge of the frequency of these bursæ, and that it will stimulate some of them to continue investigations in a similar direction.

The Structure and Presence of the Bursæ Mucosæ and Vaginæ Tendinum Mucosæ.

The mucous bursæ are, as mentioned above, usually closed, flattened sacs of various sizes; when filled or injected they assume an oval or globular form. In the normal condition they contain a small quantity of fluid similar to that found in joints (synovia), so that their internal surfaces are separated from each other by a thin layer of fluid to allow the structures in contact with their external surfaces (skin, muscle, tendon, or bone) to glide easily over each other. The walls of the sac are composed of a transparent connective tissue membrane varying in thickness; they are sometimes loosely united to the neighbouring organs, at others intimately connected with them, so much so that it is difficult to say whether the sac possesses a distinct membrane of its own or not. Their internal surfaces present different appearances in different bursæ. Mostly—and this is the case with those found under muscle and tendons—they are smooth, and only present here and there papillous

formations, resembling those found on the internal surface of synovial membranes of joints. These papillæ are occasionally of a red colour, due to a loop of blood-vessel traversing them. On the other hand, the internal surface of the subcutaneous bursæ are uneven, this is due to the fibres of their external coat taking diverse directions, for no distinct boundary can be defined. The fibres may frequently be seen passing across the lumen of the sac and mingling with similar fibres from the opposite side, so that a network of fibrous tissue is found in the bursæ. We also find the sac lined with a greyish-red, unctuous, fatty material, which is the result of a fatty degeneration of the internal surface of the sac. Whether the latter is merely a pathological change, we are, at present, not prepared to say; but such a condition has frequently been the case in the bursæ situated under the skin on the anterior spinous process of the ilium.

These conditions, and the circumstance that the walls as well as the partitions of these bursæ are composed of condensed subcutaneous connective tissue, give sufficient evidence of the genesis of these questionable formations, which we will now study more minutely.

We may conveniently divide the Bursæ mucosæ into two groups: 1st, the superficial, or those found under the skin, BURSÆ SUBCUTANÆ; and, 2nd, the deep-seated, or those found in connection with muscle and tendons, BURSÆ SUBTENDINOSÆ. Subcutaneous bursæ may appear in any part of the body where the skin plays over a bony or hard projection, as, *e.g.*, under the skin covering the antero-inferior spinous process of the ilium, olecranon, tuberositos-calcanei, the maleoli, and less frequently under the skin covering the patella, withers, sacrum, and on the extension side of joints. The size and presence of these bursæ are very uncertain and changeable, so much so, that great differences may exist even when comparing one side of the body with the other of the same animal; and any comparison of their presence in young and aged animals must be left out of the question. The older the animal the more numerous will these bursæ be. None are found in the fœtus, thus showing that these sacs are formed with age, and are the result of mechanical agencies. His* explains their formation as follows:—When the skin moves over joints (during flexion or extension), or passes over bony or other hard protuberances, the subcutaneous connective tissue becomes torn or ruptured, thereby causing spaces into which fluid collects. The boundary walls of these spaces are at first irregular, and formed by the adjacent subcutaneous tissue; they may retain their torn appearance for some time, but gradually lose it, and become finally smooth; in either case a structure is formed which we call a Bursa subcutanea. The fact that the endothelial lining is wanting in these structures, or if present, is incomplete goes a long way to prove the truthfulness of the assumption that these bursæ are formed after the fœtus has left the uterus.

The Bursæ subtendinosæ are much more constant in their appearance than are those under the skin, although individual deviations are not uncommon. They are found at all periods of the animal's life, even the newly-born foal possesses most of the profound bursæ. In six-months-old calves (which are about sixty cm. long), not only are the tendon sheaths present, but also a large number of the subtendinous bursæ; *e.g.*, I have found them as large as walnuts under the insertion tendon of the M. biceps femoris (Triceps abductor femoris), the Bursæ glutii medii (Gluteus maximus), the bursa under the origin of the M. extensor digitorum Pedis longus (Extensor pedis), Bursæ intertubercularis, etc. All these bursæ were relatively larger than they are seen in older animals. In a bovine fœtus thirty-six ct. long many of these bursæ could be found. These facts

* HIS, "Die Haute und Hölen des Korpers." *Akademisches Programme.* Basel, 1865.

doubtless tend to prove that the sheaths of tendons, as well as the majority of the subtendinous bursæ, are developed before birth, as a result of the mechanical action of the muscles (friction), a circumstance which accounts for their structure and uniform presence. This is our reason also for taking these deep-seated bursæ as the type of these organs, in preference to those found immediately under the cutis. Undoubtedly many of these deep-seated bursæ are formed during extra uterine life, as may be inferred from the absence of many of them ; and when they are present they resemble the subcutaneous bursæ in structure, possessing uneven, fibrinous walls. It is not improbable that these occasional bursæ are due to some peculiar method of using the animal, or to pathological changes producing modified movements in certain parts of the body, and as a result rupture of the intermuscular or subfacial connective tissue.

The position of these bursæ are—as mentioned above—either under the ends of muscles or tendons, or on such hard protuberances as these structures play over ; and the bursæ are usually united to these structures. Several of the subtendinous bursæ are in communication with tendon sheaths and the capsules of joints ; *e.g.*, the Bursæ calcanea with the sheath of the superficial flexor of the phalanges (Gastrocnemius internus), the bursa under the origin of the Flexor metatarsi with the stiffle joint, also with the same joint the bursa situated under the medial (internal) lateral ligament of the joint ; at the elbow joint the bursa under the origin of the Flexor metacarpi externus and internus, and the flexors of the phalanges. The last-mentioned is only a blind pouch from the joint capsule itself. Henlé has justly named such sacules *Bursæ synoviales.** According to Heinecke†, the communication between these bursæ and the capsules of joints and tendon sheaths is the result of absorption of the connective tissue which originally existed between them. My examination of these structures in horses leads me to corroborate this statement, because in different individuals these communications may be wanting, whereas in others we find two bursæ united into one ; this latter often occurs under pathological conditions such as distension of two adjacent bursæ, the pressure causing their walls to become absorbed.

(*To be continued.*)

MICRO-ORGANISMS AND DISEASE.

BY E. KLEIN, M.D., F.R.S.‡

INTRODUCTION.

THE relation of micro-organisms to the infectious diseases is admitted to be very intimate ; and although it may not be quite so universal as some are inclined to assume, it is nevertheless definitely proved to exist as regards some of the infectious maladies affecting man and brutes. In order to pass in review all the ascertained facts and observations in this vast and constantly-growing field of pathology, and to appreciate and to assign their true value to the many observations bearing on this relation of micro-organisms to disease, it is necessary that the reader, and still more the worker in this field, should be enabled to criticise the observations and facts brought forward by the numerous writers on the subject, for otherwise he would probably take as proved what has really not passed beyond the stage of possibility. And it is this point which requires the most careful attention,

* "Handbuch der Banderlehre des Menschen."

† "Anatomie und Pathologie der Schleimbeutel und Scherenscheiden." 1867.

‡ From the "Practitioner."

viz., to be able to see at a glance that, owing to the imperfect or faulty method of investigation employed, or that, owing to certain inferences incompatible with the general laws and general tendency of the well-founded and experimentally proved facts, the statements set forth in a particular observation or series of observations are not to be accepted.

In all investigations of the relation of micro-organisms to disease, it is necessary to bear in mind that, as Koch* has pointed out, no observation can be said to be complete, or, one should rather say, in no instance can it be said to have been *satisfactorily proved*, that a particular infectious disease is due to a particular micro-organism if any one of the following conditions remain unfulfilled :—(1) It is absolutely necessary that the micro-organism in question is present either in the blood or the diseased tissues of man or of an animal suffering or dead from the disease. In this respect great differences exist, for in some infectious diseases the micro-organisms, although present in the diseased tissues, are not present in the blood ; while in others they are present in large numbers in the blood only or in the lymphatics only. These points will be considered hereafter in the special cases. (2) It is necessary to take these micro-organisms from their nidus, from the blood or the tissues as the case may be, to cultivate them artificially in suitable media *i.e.*, outside the animal body, but by such methods as to exclude the accidental introduction into these media of other micro-organisms ; to go on cultivating them from one cultivation to another for several successive generations, in order to obtain them free of every kind of matter derived from the animal body from which they have been taken in the first instance. (3) After having thus cultivated the micro-organisms for several successive generations, it is necessary to re-introduce them into the body of a healthy animal susceptible to the disease, and in this way to show that this animal becomes affected with the same disease as the one from which the organisms were originally derived. (4) And, finally, it is necessary that in this so affected new animal the same micro-organisms should again be found. A particular micro-organism may probably be the cause of a particular disease, but that really and unmistakably it is so can only be inferred with certainty when every one of these desiderata has been satisfied.

It will be my aim in the following pages first to describe the methods that may be employed with success in investigations bearing on the relation of micro-organisms to disease ; secondly, to describe, in conformity with reliable observations, the morphology and physiology of the micro-organisms that bear any relation to disease ; and thirdly, to enumerate the observations that have been made in recent years to prove the existence of such an intimate relation. Last, but not least, we shall consider the precise relation of the particular micro-organisms to the causation of disease.

Chapter I.—Microscopic Examination.

For the examination of micro-organisms good high powers are essential—at the least a power magnifying 300 to 400 linear diameters. Zeiss' D or E, and Zeiss' or Powell and Lealand's oil immersion, $\frac{1}{12}$th or $\frac{1}{16}$th inch will be found sufficient for all purposes. In the case of tissues stained with aniline dyes, a good substage-condenser, such as Abbé's or Powell and Lealand's, is invaluable. I use Zeiss' stand with Abbé's condenser, open diaphragm, and plane mirror. As Koch† pointed out, and what is now universally acted upon, stained specimens mounted in Canada-balsam solution or Dammar

* "Die Milzbrand-impfung." Cassel and Berlin, 1883.

† "Die Aetiologie d. Wundinfectionskrankheiten," p. 34. Leipzig, 1879. Translated as "Traumatic Infective Diseases" (New Syd. Soc.). London, 1880.

varnish, when examined on Abbé's condenser, show the micro-organisms with extreme clearness and sharpness.

The examination of the morphological characters of an organism is carried out on fresh unstained as well as on fresh stained microscopic specimens. Although the latter method is, for reasons hereafter to be mentioned, by far the most perfect and realiable one, it is nevertheless important to ascertain as far as possible the appearances, chemical reactions, and general morphology of perfectly fresh specimens. Blood, juices, tissues, and fluids in which the micro-organisms have been growing, are subjected directly, without any previous preparation, to microscopic examination. With artificial nourishing media in which micro-organisms have been growing, the examination of fresh specimens is of great importance, for the reason that the organisms can be easily identified, and their size and general morphological characters be more correctly ascertained than after drying, hardening, and staining. Besides, the chemical reactions can be satisfactorily studied in fresh specimens only. All one has to do is to draw up with a capillary pipette, or to take up with the point of a needle, a drop or particle of the material, to place it on an object-glass, and to cover it up with a thin cover-glass. Where one has to deal with liquids, such as artificial nourishing fluids, blood, serum, tissue-juices, secretions, transudations, and exudations, no addition is required. In the case of more solid material, such as solid artificial nourishing material, bits of tissue, etc., the addition of a drop of neutral previously well-boiled saline solution (of 0·6 to 0·75 per cent.) is advantageous, although not absolutely necessary, since by pressing down the cover-glass a layer of the material sufficiently thin for examination can be obtained. In some instances a bit of tissue can be teased out into fine particles by means of two clean needles. Where it is a question of micro-organisms sufficiently conspicuous by their shape, size, and general appearance, their identification in the fresh condition is not difficult; this is the case with bacilli, actinomyces, and mycelia, but in the case of micrococci, especially when isolated or in couples, and lying in blood, juices, or tissues, their recognition is often extremely difficult. When in large clumps, such as larger or smaller masses of zoogloea, or when in the shape of chains, the identification is not difficult; but in the more isolated state they are not easily recognised, owing, as a rule, to the presence of granules or particles of various kinds, from which morphologically their distinction is well-nigh impossible. In such cases there are certain rules of thumb, if I may say so, which assist, although they do not absolutely ensure, the diagnosis. These are the micro-chemical reactions. The addition of liquor potassæ leaves micro-organisms quite unaltered, whereas fatty and most albuminous granules alter or altogether disappear by it. Acetic acid from 5 to 10 per cent. strong does not affect micro-organisms, but albuminous or other granules become in most instances altered. These two reagents, I think, are as reliable as any others; if they fail, then others like alcohol, chloroform, sulphuric ether, etc., are not of any greater help, but the latter reagents may be used, for instance, when it is a question between fat-granules and micrococci, or crystals and bacilli.

Micro organisms have a greater affinity for certain dyes, especially analine dyes, and therefore these are used with great success to demonstrate their presence, and to differentiate in many instances morphological details which in the unstained condition are not discernible. The staining is effected on fresh, unaltered organisms, or after they have become dried. In the first instance the process is carried out thus:—A microscopic specimen is made, and to it is added afterwards drop after drop of the dye, passing it through the specimen in the usual way of applying fluids to a microscopic specimen, *i.e.*, by adding with a capillary pipette the dye at one margin of the cover-

glass, and sucking it up with a strip of filter-paper applied to the opposite margin of the cover-glass. When the staining has taken place, the excess of the dye is washed away with salt solution, water, or alcohol, or both, as the case may be (see below). Unless the organisms are embedded in continuous masses of solids, this method gives good results. In the latter case, say if they were embedded in a microscopic lump of tissue, or in a particular spot of a fine section of fresh tissue, it is necessary, after having placed the lump or section on an object-glass, to drop the dye on to this previous to putting on the cover-glass. After some minutes the dye is allowed to run off by inclining the object-glass, and then the washing is proceeded with till all the excess of the dye is removed; the mounting is then done by placing a drop of water or salt solution on the specimen and covering it with a cover-glass. In the case of sections through fresh and hardened tissues containing micro-organisms, the method of staining and of permanently mounting them as a whole is more complicated, and will be detailed presently. When one has to deal with coherent masses of micro-organisms, present either in natural media (*i.e.*, animal tissue), or artificial cultivations, such as zoogloea and pellicles of *micrococcus* or *bacterium*, these can be bodily transferred to a watch-glass, stained, washed, and mounted without much difficulty, either for immediate or permanent use. The permanent specimens are made in this way:—Place the sections or pellicle in a watch-glass containing the dye, leave it there till deeply tinted, take out with a needle, or the like, wash in water, then in alcohol, leave here for five minutes or more till most of the excess of the colouring-matter is removed, then lift it on to an object-glass, spread well out, place on it a drop of clove oil, and after a minute or two drain off the clove oil, add a drop of Canada-balsam solution (in chloroform or benzol), and cover with a cover-glass. In some special instances, such as the bacilli of Leprosy and Tuberculosis, double staining is required. With other organisms, such as the bacilli of Glanders or Tuberculosis, the washing is carried out, not with water, but with acid (acetic acid and nitric acid respectively). All these details will be stated when dealing with these special organisms.

The method extensively and successfully used for the demonstration and preservation of microscopic specimens of micro-organisms in fluids, as blood, pus, and juices, is that of Weigert and Koch, which consists in spreading out on a glass slide or cover-glass a very thin film—the thinner the better—of the fluid (artificial or natural culture medium), blood, pus, or juice, and drying it rapidly by passing it several times over the flame of a spirit-lamp or gas-burner. The most successful preparations are obtained when the heating is carried on for such a time (one or two minutes) that the film, having become opaque at first, rapidly turns transparent. Several drops of the aniline dye to be used are then poured over the specimen, and after remaining on it from five to thirty minutes or more, are poured off. The aniline dyes used are those that are commonly known as having a great affinity for cell-nuclei (Hermann); they are also known as the neutral or basic, but not the acid ones. The most useful aniline dyes amongst them are those that are soluble in water; these are preferable to those soluble in alcohol, but in certain special instances (to be mentioned hereafter) some of them are of definite use. Methyl-blue, methyl-violet, vesuvin, Bismarck-brown, magenta, fuchsin, rosanilin, gentian-violet, Spiller's purple, eosin, dahlia, purpurin, iodine-green, are the aniline dyes commonly used. The washing is carried out in all cases, except with tubercle-bacilli and the bacilli of Glanders, with distilled water, then with alcohol; this latter, as a rule, is to wash out the dye from all parts except the micro-organisms, and it is therefore necessary not to carry the washing further than this, but to carry it as far as practicable. After this, wash again with distilled water, dry, and mount in a drop of Canada-

balsam solution. Throughout this process it is of course necessary always to remember on which side of the glass the specimen has been dried.

Double staining is carried out with any two of the above dyes; as a rule, a brown and blue or violet, or a red and blue, are preferred. Some of the voilet and purple dyes have the peculiarity that in some—not in all instances—they give to the preparation a double tint—some things appear blue, others more pink.

The process of double staining is carried out either for each dye separately—*i.e.*, we first apply one dye, after some minutes wash in distilled water, and then apply the second dye—or the two dyes to be used are mixed and then used like a single dye.

In the case of tubercle-bacilli the staining is first done with a magenta mixture (Ehrlich's, Weigert's, or Gibbes'), then washed for a few seconds with a 10 per cent. solution of nitric acid, then for a few minutes with distilled water. After this the preparation is stained with methyl-blue in the ordinary way. Or, after Koch's method, the specimen is first stained in alkaline methyl-blue (mixed with a 10 per cent. solution of caustic potash) for twenty-four hours, dried for half an hour to one hour at a temperature of 40° C., and then stained in a concentrated solution of vesuvin. Wash it next with water, then with alcohol, dry, and mount in Canada-balsam solution.

In Leprosy, the specimen on the glass is stained with magenta, then washed in distilled water, then stained with methyl-blue, washed and mounted. With such organisms — as, *e.g.*, the micrococcus in the sputum of acute croupous pneumonia, and the micrococcus in gonorrhœal discharge—the staining is best carried out with a mixture of methyl-blue and vesuvin.

Weigert's double stain is very excellent for many purposes; it is prepared thus :—

Saturated watery solution of aniline, 100 ccm.

[This is made thus :—Aniline oil, 1 part, dist. water, 3 parts. Shake every half-hour for four hours, and decant the water as the oil settles to the bottom.]

Saturated alcoholic solution of fuchsin, 11 ccm. Mix.

The sections are well-stained in this mixture, then washed in distilled water; after this they are immersed for a few seconds in alcohol, and then transferred for one, two, or three hours to the following solution :—

Distilled water, 100 ccm.
Saturated alcoholic solution of methyl-blue, 20 ccm.
Formic acid, 10 minims.

After this, wash in alcohol, pass through clove oil, and mount in Canada-balsam solution.

In examining fresh or hardened tissues for micro-organisms, it is necessary to make thin sections, which can be easily done with the aid of any of the microtomes in common use, amongst which Williams' microtome, and especially Dr. Roy's ether-spray freezing microtome, are no doubt the best and easiest to manipulate. As regards hardened material, it is necessary to remember that the hardening must be carried out properly, small bits—about a half to one cubic inch—of tissue being placed in alcohol, or, better, in Müller's fluid, and kept there; in the first instance, for two to five days; in the second, for from one to three weeks or more. Then small bits are cut out, of which it is desired to make sections. Those hardened in spirit must be soaked well in water to enable the material to freeze, then superficially dried with blotting-paper, and then used for cutting sections with Roy's microtome Those hardened in Müller's fluid are at once superficially dried with blotting-

paper and cut. When making sections with Williams' freezing microtome, it is necessary to soak the material first in gum mucilage, and then to freeze and to cut. Fresh tissues are at once cut with the freezing microtome, the sections placed in 0·6 per cent. of saline solution, floated out and well spread out, and then stained by transferring them in this condition, *i.e.*, well spread out, into a watch-glass containing the dye. The sections of hardened tissues are floated out in water, well spread out, and then transferred to the dye or dyes as the case may be.

It is necessary to prevent too much shrinking of the sections, especially those of fresh tissues; for this reason it is advisable to float the sections in the saline solution or water, as the case may be, on a broad lifter or spatula, to spread them well out upon it, and to transfer them carefully into the dye, then into the dish with water used for washing off the excess of the dye, to transfer them, well spread out on the lifter, to alcohol, then after several minutes to oil of cloves, and finally on to a glass slide, on which they are mounted in the usual manner with Canada-balsam solution, the excess of clove-oil being previously drained off.

Chapter II.—Preparation of Culture Material.

Artificial cultivations of micro-organisms in suitable nourishing media in the incubator, at temperatures varying between 30° and 40° C., are necessary in order to study more accurately the life-history of the septic as well as the pathogenic organisms. Moreover, large numbers of them become thereby available, and their exact relation to disease can thus be tested more conveniently. For if it should be found that, having carried on outside the animal body successive cultivations of a particular organism, the reintroduction of this cultivated organism into the animal body is again productive of the same disorder as before, then the conclusion becomes inevitable that this organism is intimately related to the causation of the disease. It must be conceded that after several successive cultivations any hypothetical substance supposed to be the *materies morbi*, and introduced at the first remove from the blood or tissues, being in a very diluted condition in the first cultivation, would after several cultivations be practically lost. But if this last cultivation should be found to act in the same manner pathogenically, *i.e.*, if every droplet of it, charged with the new brood of the organism, nevertheless possesses full pathogenic power, then it is logical to say that this pathogenic property rests with the organism. For this and other reasons it is of essential importance to be able to carry on successive cultivations of one and the same organism without any accidental contamination or admixture—*i.e.*, it is necessary to carry on *pure cultivations*.

A.—*Fluids.*

As fluid nourishing material the following are used with preference :—

1. *Broth made from meat—pork, beef, rabbit, chicken.*—The connective tissue and fat are first cut out from the fresh meat—in the case of rabbit or chicken, the whole animal without head or viscera is used—and then placed in water and boiled. Generally for each pound half an hour's good boiling is allowed. With regard to the quantity of water, each pound of meat ought to yield ultimately at least one pint of broth. When boiled, the broth is allowed to stand, the fat is skimmed off, and the broth well neutralised by adding liquor potassæ, or, better still, carbonate of sodium.

The fresher the meat the less acid (sarcolactic acid) is in the broth before neutralisation. The broth is then filtered through a filter, previously over-heated, into flasks previously sterilised. If the broth is not clear after once filtering, it is filtered again. If not clear then,

it is allowed to stand for several hours. A fine sediment is found at the bottom of the vessel, and from this the clear supernatant fluid is decanted into a sterilised vessel. The broth, if not clear after the first filtering, can be cleared by boiling it with the white of an egg. The now clear fluid is filtered again. The flasks which receive the broth are well plugged with sterilised cotton-wool. In this state the flask is placed over a Bunsen burner on a wire netting and boiled for half an hour or more; during the boiling the cotton-wool plug is lifted out for half its length. The flask ought not to contain more broth than about one-half or two-thirds of its volume, to prevent the broth from rising too much and wetting the plug. When turning off the flame the plug is pushed down so as fully to plug the neck and mouth of the flask; a beaker with sterile cotton-wool cap is placed over the mouth of the flask, and this is allowed to stand for one night. Next day the boiling is repeated for half an hour or more in the same manner as before. If the meat has been fresh and the vessels and cotton-wool have been sterile, twice boiling is found sufficient to destroy every impurity. But to make sure, the broth is placed in the incubator and kept there for twenty-four hours at a temperature of 32°—38° C., and then boiled on the next day for half an hour in the usual way. The supposition is made that if by any chance after twice boiling the broth it should contain unchanged spores of bacilli—the only organisms that will resist boiling, although they do not resist boiling for more than half an hour—the spores would germinate into bacilli when kept for twenty-fours hours in the incubator at 32°—38°, and these would then be killed by the third boiling. As a matter of fact, I have not as a rule found any contaminating germs survive the second boiling. It is of course to be borne in mind that during the first as well as second and subsequent boiling the cotton-wool plug is not removed from the mouth of the flask, but is only raised out half its length from the neck. The cotton-wool and the cotton-wool cap and beaker are replaced immediately or simultaneously with the turning off of the burner. This broth so prepared is placed in the incubator at 32°—38° C., and kept there from one to three weeks. If, as is generally the case, it remains limpid, it is considered completely sterile.

2. *Peptone and Sugar Solution.*—Beef peptone (Savory and Moore's) is dissolved in distilled water, over a burner, to the amount of about 2 per cent.; to the solution is added cane-sugar to the amount of about 1 per cent., so that every 100 ccm. of the fluid contains two grammes of peptone and one gramme of sugar. When dissolved, it is well neutralised and then filtered (the vessels being of course also in this, as in all other cases, sterilised by overheating) into flasks, and treated in the same manner as the broth.

The same fluid can be used without the addition of the cane-sugar.

3. *Buchner's Fluid.*—10 parts of Liebig's extract, and 8 parts of peptone, in 1,000 parts of water.

4. *Hydrocele Fluid* (Koch).—A new or well sterilised (by overheating) trocar and cannula are used for the tapping; to the cannula is fixed an indiarubber tube that has been soaking in strong carbolic acid solution for forty-eight hours. The distal end of the tube is introduced carefully and rapidly into the neck of a sterilised flask plugged with sterile cotton-wool, and the fluid thus allowed to flow into the flask to about two-thirds of its volume.

This is then exposed in a water or sand-bath to a temperature of from 58° to 62° C. for three to five hours on five or six consecutive days. Placed then into the incubator at 32°—38° C. for from one to three weeks, the fluid remains limpid.

(*To be continued.*)

Reviews.

THE RELATION OF ANIMAL DISEASES TO THE PUBLIC HEALTH, AND THEIR PREVENTION. By FRANK S. BILLINGS, D.V.S. (New York : Appleton and Co.)

Mr. Billings, who is a graduate of the Berlin Veterinary Institute, has compiled, chiefly from German and English books, a work which is, as the preface states, "for the benefit of the people of the United States," with the object of introducing "to every man and woman of the country a new subject—the higher purposes of veterinary medicine." And, immediately after, it is written : "While, at times, the language of the author may appear unnecessarily severe to the casual reader, he should not forget that the author is an enthusiast." The intimation was necessary, for a more extraordinary production, so far as severity, unfairness, and abuse are concerned, we have not met with for a long time. Mr. Billings is, doubtless, an enthusiast, but he is also something besides ; and that something will detract, not only from his first literary venture, but from all the good that his enthusiasm might otherwise effect. No profession is ever much benefited by such enthusiasts.

The book contains 441 pages, but only 208 of these are devoted to animal diseases, the remainder being occupied with a brief but disjointed history of veterinary medicine ; a long disquisition, at second hand, on the establishment of European veterinary schools ; a discourse on the advantages to be obtained by the institution in the United States of a national veterinary police system ; and a strong chapter or section on the necessity for establishing a national veterinary institute in the States. Our American cousins have abundant enterprise, plenty of spare dollars, and great numbers of animals of various kinds, which require, at some time or other, the services of veterinary surgeons to protect them from contagious disorders, or treat them when sick or injured. It pays a country to have well-educated and well-trained veterinarians, and if the States, individually or collectively, can be made to understand this and act upon it, then so much the better for that great continent. It may be doubted, however, whether the author of this book is the man to effect such a revolution. His manner is too *brusque*, his language is too *bizarre* and egotistical, and his advocacy too violent and aggressive, to convince the incredulous, gain the support of the well-disposed, or convert opponents into firm friends.

There is, as might be expected, nothing novel in the first portion of the book—that relating to those diseases of animals which endanger the public health—except the curious bastard English in which much of it is written, and which the author's German professional training is responsible for, but which the American public—*every man and woman*—will be immensely puzzled to understand. Indeed, we question if there are many veterinarians or medical men in the States, or anywhere else, who will readily comprehend some of the expressions. For instance, at page 7, in treating of Trichiniasis, he states that the parasites are not equally distributed over the "musculature of the autosite," which means, we

presume, the muscles of the infested animal; at page 13 we find "mesenterium" instead of mesentery, "*trichin* infected flesh;" and elsewhere "cadavers," "the *ens* of disease," "scientific researcher," and so on.

With regard to unfairness, we may note that in the chapter on Swine Plague, or "Hog Cholera," as he heads it, he states (p. 42) that American veterinarians established beyond doubt the true nature of the disease; and gives to Law and Detmers the credit of having discovered the bacilli peculiar to the disease. This discovery was made in this country by Klein, and the first to point out the infecto-contagious nature of the malady, as well as its morbid anatomy, was Dr. Budd, of Bristol. Not only this, but this author adopts, without acknowledgment, the name given to this disorder by Klein—*Pneumo-Enteritis Contagiosa*. Klein's researches have been more important and original than any yet attempted in the States. Then again, with regard to Emphysema Infectiosum, he has the temerity to assert that Professor Feser is the only one, with Bollinger, who has given any special study to the disease. He might, or should, have known that Arloing, Cornevin, and Thomas, in France, have studied it for years in the most successful manner; that their discoveries have been presented at various times to the Paris Academy of Medicine and Academy of Sciences, that the success of their prophylactic inoculation has been fully established, and that a most complete monograph, entitled, "Charbon Bacterien, ou Charbon Symptomatique," was published at the commencement of last year. But Mr. Billings evidently knows little, if anything, of what has been done in recent times by French veterinarians.

One example of his style of disparagement will suffice. In treating of Texas Fever, he writes:—

"My own studies have been made upon the report of John Gamgee to the Commissioners of Agriculture of the United States on Animal Diseases, and published in 1871. I wish it were possible for me to say one single word in favour of this report. It is a disgrace to the Veterinary profession, to the man who wrote it, and to the Government which published it. It is a miserably arranged, illogical, and erroneous production. Symptoms, definition, and periods, are mixed up, and there is no connection between the parts. The pathological anatomy is simply abominable, and one which I should be ashamed to have a student produce."

This is pretty much the style in which the book is written. Unable to furnish any information himself, he utilises what has been provided by others, and if they be other than American or German, he abuses them.

We have said enough to show that this is not a book to benefit the veterinary profession in any way, nor yet will it confer any advantage on the United States. It is dedicated to the memory of Professor Gerlach, late director of the Berlin Veterinary Institute. We fancy Gerlach, if alive, would have been inclined to refuse the dedication, had he known the character of the work.

ANIMAL CASTRATION. By A. LIAUTARD, M.D., H.F.R.C.V.S. (New York: Jenkins.)

In a handy book the Principal of the American Veterinary College has treated the subject of castration in a clear and concise manner. The various methods of operating, the preparation, risks, and consecutive treatment are dealt with very satisfactorily. The book is embellished with forty-four woodcuts, which materially enhance its value, and permit us to recommend it as an eminently trustworthy guide, for young veterinary practitioners especially.

VETERINARY NOTES FOR HORSE OWNERS. Third Edition. By M. HORACE HAYES, M.R.C.V.S. (London: W. Thacker and Co.)

Captain Hayes, in the new edition of "Veterinary Notes," just published, has added considerably to its value by including matter which was omitted in the former editions, and rendered the book, if larger, at any rate more useful to those non-professional people who may be inclined or compelled to treat their own horses when sick or injured. So far as we are able to judge, the book leaves nothing to be desired on the score of lucidity and comprehensiveness; and though it is impossible to teach practical and manual details in veterinary medicine and surgery to amateurs by means of books only, yet readers of these notes may learn something of the more common diseases and accidents to which the horse is liable. Beyond this the author does not evidently intend to carry his instruction.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD OCTOBER 2ND, 1884.

Professor WALLEY, President, in the Chair.

Present:—Gen. Sir F. Fitzwygram, M.P.; Professors Robertson, McCall, Williams, and Pritchard; Messrs. Cartledge, Wragg, Perrins, Barford, Dray, Santy, Woods, Cartwright, Greaves, Borthwick, Taylor, Whittle, Duguid, Blakeway, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the previous meeting were taken as read.

Absentees.

Letters were read from Messrs. Cox, Walters, Fleming, Brown, Lambert, Simcocks, and Reynolds, regretting their inability to attend.

Illness of Dr. Fleming.

The PRESIDENT called attention to the illness of Dr. Fleming, and said that those present must all be aware of Dr. Fleming's labours on the Council for the good of the profession, and he thought the least they could do would be to pass a vote of sympathy with him, and Mrs. Fleming, in his illness.

Mr. DRAY seconded the motion, which was carried unanimously.

Presentations to the Library.

The following works have been received :—"Journal de Médecine Vétérinaire et de Zootechnie;" "Lehrbuch der Thierartzlichen Geburtshilfe," by Prof. Dr. Garsten Harms; "A Text-Book of Operative Surgery," by Dr. George Fleming; and the "Annual Report of the Agricultural Department, Privy Council Office," for 1883.

Correspondence.

A letter from Professor P. Heaton, acknowledging his appointment as an Examiner in Chemistry, and also a letter from Mr. George Thatcher, thanking the Council for his appointment to the office of College Solicitor. There was also read a communication from the Privy Council, stating that they had received a complaint from a registered practitioner of the heading put to the No. 3 Register, which was to the effect that, as the existing practitioners had not undergone the qualifying test as prescribed by the Royal College of Veterinary Surgeons, the Council could not be held responsible for their professional qualifications.

Professor ROBERTSON thought the Council should not have inserted the heading complained of, and he had objected to it when it was agreed to be passed by the Registration Committee

Professor WILLIAMS moved, "That the opinion of the College Solicitor be taken on the matter."

Mr. TAYLOR seconded the motion. If the solicitor said that it was not illegal, they could write to the Privy Council to that effect.

Mr. CARTLEDGE said that inasmuch as these registered practitioners had undergone no examination by the College, he could not see how the Council could be responsible for their qualifications, and he failed also to see the injustice of heading the register in the way named. The Council were asked for an opinion, and he thought they might take upon them to say that they believed they had acted according to the rights of the College in what they had done. A simple answer would no doubt be satisfactory to the Privy Council, because the legality of the proceeding had not been questioned; but Professor Williams' motion would bring them face to face with that point, and then if it was found they had acted illegally they would have to draw in their horns

Professor MCCALL did not think that the matter was one in which there was anything legal or illegal The men had not passed the College examinations, and therefore ought not to be recognised.

Mr. CARTLEDGE said he would move as an amendment that the Council reply to the Privy Council without resorting to the solicitor for an opinion.

Professor MCCALL seconded the amendment.

Mr. GREAVES supported the amendment, and remarked that their late President was strongly of opinion that the clause in question should be inserted.

The PRESIDENT was of opinion that to place the names of a number of men in such a prominent position in the College Register without the addition of some such remark as that alluded to, was simply to make the Council responsible, in the eyes of the public, for their qualifications to practise as veterinary surgeons; he did not see that the least injustice had been done to them.

The amendment was then put, six voting for it; the original motion followed, for which ten voted, and it was therefore declared carried.

The application to the President and Vice-Presidents of the College by Mr. T. W. Mayer asking that the sum of money given by him some years ago to the College Building Fund should be refunded, he being now in pecuniary difficulties, was next considered.

Mr. TAYLOR said he was of opinion the Council had no power to accede to the request, and moved that the money be not refunded.

Mr. CARTWRIGHT seconded the motion.

Professor ROBERTSON said that Mr. Mayer had occupied a very important position in the profession prior to the Charter of 1844 being obtained. He had exerted himself to a considerable extent to get that Charter, and had expended his own money in endeavouring to secure it. He had been a very useful man, but unfortunately he had got into difficulties. All he asked the Council to do was to refund the amount out of a surplus which remained over from the money required to procure the Charter. He (Professor Robertson) was aware that the Council could not do as they were asked, because they were only trustees for another body, but he thought they ought to be made aware of the unfortunate gentleman's position.

Mr. TAYLOR asked if he did not derive an income from the Government.

Professor ROBERTSON said he did; some nine shillings a day, he believed.

Mr. WRAGG said that Mr. Cox had asked him to tell the Council that Mr. Mayer was afraid of being made a bankrupt, and bankruptcy would mean a stoppage of his pension, and £40 or £50 would put him right again.

Professor PRITCHARD considered that the Council had no power to refund the money.

Mr. GREAVES suggested that, out of respect to a gentleman who had once stood high in the profession, and whom they all respected, a committee should be formed to receive individual subscriptions towards his relief, since the Council was precluded from making use of the College funds.

The CHAIRMAN remarked that, however worthy of consideration the suggestion might be, it was one outside the official duties of the Council, but might be acted upon by any individual member.

The Secretary was ultimately instructed to write to Mr. Mayer, and express the regret of the Council at not being able to refund the money.

The application of Mr. John Dobson, practising in Manitoba, for a certificate, his diploma having been destroyed in a fire, was, on the motion of Mr. BARFORD, seconded by Mr. PERRINS, allowed, and the certificate to be granted.

Report of the House and Building Committee.

At the last meeting of the Council the Committee was instructed to purchase the freehold if it could be got, the solicitor of the estate having said that this could be done if sufficient consols were purchased to produce £64 annually, which would require an expenditure of £2176. With regard to the house accommodation for the Secretary, in lieu of the present building, the Committee recommended that the sum of £70 be allowed, dating from June last. At a further meeting of the Committee the agreement between the vendor and Council was read and considered, the Committee recommending that the purchase-money, say £2133 6s 8d. consols, be paid out of the investments in consols. It was also recommended that the architect's estimate of £3500 be approved with the proviso that it did not exceed this amount, and that any excess incurred above the required sum be paid out of the General Account of the College.

Council Account.

Mr. TAYLOR asked why the sum for the Secretary's loss of residence should commence from the last summer meeting, when his change of residence did not begin till September 29th.

It was pointed out that the Secretary had been obliged to leave the College in June, because there were not the necessary conveniences to enable him to live there, as reported previously.

Mr. CARTLEDGE proposed that the recommendation of the Committee should be adopted.

Professor WILLIAMS seconded the motion.

The PRESIDENT said the amount was granted to the Secretary in lieu of house, gas, rates, taxes, etc., and explained that to provide the Secretary with a new building would require an extra expenditure of about £2,000 to £3,000, so that the plan proposed would be really a saving to the College.

Mr. TAYLOR said most likely a caretaker would be required for the new premises, which would be an additional expense. He thought the Council were making too great strides.

The PRESIDENT said the caretaker's wages would not be more than £20 a year.

Mr. TAYLOR said that when the expenses of the freehold and building were paid, it would not leave more than £2,000 in hand.

The PRESIDENT said that he had strong hopes that there would be no necessity to touch the General Fund of the College; he had not, for various reasons, subscribed himself, but he was ready to give his mite, and he was quite sure that when once matters were put into proper shape there would be numbers of members of the profession in Scotland, as in England and Ireland, who would give a helping hand.

Sir FREDK. FITZWYGRAM then went into details of the necessary expenditure in connection with the new building.

The motion for the adoption of the report was then put and agreed to, the President being empowered to sign the agreement for the purchase of the site.

Consideration of Plans.

Mr. TAYLOR asked what security would be given that the entire cost of the new building would not exceed £6,500.

The PRESIDENT said they were not bound down to that price. That was the architect's estimate, and they would probably accept the tenders for the work that were within that estimate.

The plans were agreed to.

Mr. BARFORD moved and Mr. PERRINS seconded, that the tenders to be invited be examined by the Committee, and all arrangements be left to them to carry out.

General Sir F. FITZWYGRAM suggested the addition of the words, "If the architect's estimate is exceeded, reference to be made to the Council."

The suggestion was agreed to by the mover and seconder, and the motion, with this addition, was agreed to.

Mr. DRAY stated that the solicitor had declared the title to be very clear, and that there were no mortgages.

The architect was instructed to draw out specifications, and the Secretary was instructed to ask for tenders for the work from a limited number of builders, say five.

The Finance Committee.

According to the report of this Committee, the liabilities, which it is recommended should be discharged, amount to £123 15s. 4d. The Committee recommend that the refreshments hitherto supplied to the students, Examiners, and Council, be discontinued, and that the students, after each being examined, should leave the College, and return, at the expiration of the examination, to learn the result, instead of being confined, as was now the case, within the building.

After some discussion on the inconvenience arising in Scotland from the students congregating with their companions at the entrance of the hired buildings in which the examinations were held, it was agreed that hence-

forth the examinations should be held at the two Edinburgh colleges alternately, it being considered that the students would then be more under the control of the principals, and the cost of a hired hall saved to the College.

Mr. DRAY, speaking on the matter of refreshments, thought that the Examiners, being very well paid, might pay for their own refreshments. The refreshments for students was an innovation of late years. When he was a student they were not supplied, and he did not see the need for them now.

Mr. CARTLEDGE said that a cup of tea or coffee was very acceptable to the Examiners after three or four hours' work. The cost to the College must be very trifling.

Gen. Sir F. FITZWYGRAM moved that the recommendation be not accepted. He thought something ought to be provided for the Examiners, the students, and the Council.

Mr. WHITTLE seconded the motion, which was agreed to.

The offer of the Principals of the Edinburgh schools to accommodate the Examiners was accepted.

Cheques for the current expenses were ordered to be signed.

Court of Examiners.

The SECRETARY read the result of the examination held by the Scottish section of the Board of Examiners in July last.

Additional Examiners for the Final Examination.

Professor MCCALL proposed that at the C or final examination Examiners be such as is indicated by Bye-law 7, relating to examinations; that is to say, that two separate and distinct individual Examiners conduct each department or section of that examination. The effect of that, said the Professor, would be that four additional Examiners would need to be appointed. If it had been possible he could have wished to increase the Examiners for the A and B examinations, but he could not see his way to it. The Council was enabled by the bye-laws to appoint a sufficient number, not exceeding twenty-two persons, to constitute a Court of Examiners; but, instead of there being twenty-two, the Court now consisted of twelve members only. There would be no additional expense if the full complement was made up, because they would not all be required, although they might be appointed. The Council would always nominate who should examine, and out of twenty-two the very best men could be selected. The paucity of Examiners greatly prolonged the examinations, which entailed expense to the students and inconvenience to the Examiners. The present Examiners did double duty; they examined both practically and orally. He did not mean to say that they did not carry out their duties satisfactorily, but their labours would be much expedited if four other gentlemen assisted them. Considering the large sums received by Examiners annually, he thought the item of travelling expenses should be abolished, and a fixed fee paid them.

Professor ROBERTSON, in seconding the motion, said, that in the north there was a great anxiety to have this motion carried, the feeling there being strong that the Examining Board had been too largely taken up by men south of the Tweed.

The PRESIDENT supported the motion, remarking that there could be no stronger argument in its favour than that the Examiners had really more work than they could possibly do with entire satisfaction or comfort to themselves. When the present Board was appointed, he proposed that the whole of the Examining Board should be enlarged, but it was not listened to. Practically, the Board consisted of eight men; and he held that addi-

tions should be made to the Examiners in every examination, and not be confined to the final. There were only two examiners on pathology and morbid anatomy, and if anything happened to either or both of them the Council would be at a loss who to appoint in their stead. There ought, therefore, to be a sufficient number appointed to fill up all blanks. In Edinburgh, on one occasion, one gentleman positively did the work of three Examiners, owing to the Board being so small.

Mr. WHITTLE also supported the motion, and regretted that it did not go in for an increase all round. A great deal of travelling expenses might be saved if some re-arrangement of the localities from which Examiners were taken was made. He believed there was no Examiner from Ireland, and he should like to see one appointed from that country, and also from Scotland.

Mr. GREAVES was always ready to agree to any plan that would increase the efficiency of the Examining Board. The Council had endeavoured for years to make the examinations uniform in England and Scotland, and so the same Examiners carried out their work in both countries, which necessarily entailed great expense in railway travelling; but he did not think that was wrong in principle, for it ensured the examinations being equal at each of the colleges. If men could be procured out of Scotland who would examine as efficiently as did the London men, then, of course, much expense might be saved in travelling. He saw no objection to the number of Examiners being increased.

Mr. TAYLOR said the present Examiners were appointed for five years, and he thought the Council had no power to elect fresh Examiners in the middle of that period. As an amendment he would propose, that the question be submitted to a committee to be appointed by the Council.

Professor PRITCHARD seconded the amendment, which was put and lost, the original motion being carried by a large majority.

A ballot was then taken for the purpose of electing the four additional Examiners, and out of seven gentlemen proposed the following were declared elected:—Messrs. Cartledge, Borthwick, Woods, and Greaves.

It was decided that it should be left to the Examiners to settle which of them should examine on cattle and which on the horse.

Marks at Examinations.

Professor ROBERTSON asked for a statement from the Council of the marks that rejected a man. When he examined for the College twenty years ago, one "bad" always rejected a man, as did two "indifferents." Now, men were being rejected with one "indifferent." He proposed that the Council pronounce upon the marks that should reject a candidate.

Professor MCCALL seconded the motion, which was agreed to.

Mr. SANTY then moved that the old marks should stand two "indifferents" to equal one bad.

Mr. BLAKEWAY seconded the motion, which was carried.

A Syllabus.

The PRESIDENT moved that a syllabus be prepared, so that it would be possible to know on what a student was to be examined. Under existing arrangements a student was sometimes examined three times on the same subject.

Professor WILLIAMS complained that there was no examination on materia medica at all. Over and over again he had seen men examined twice on one subject. The major part of the time was exhausted on anatomy and physiology, and sometimes on chemistry—indeed, he had heard it asked at the pathology table: "What is the combustion of coal?"

The PRESIDENT said that Fever was purely and simply a pathological subject, and yet it was examined upon at all the tables.

Professor WILLIAMS seconded the motion.

Professor ROBERTSON was disinclined to support the motion, thinking that it ought to be left to the judgment of the Examiners as to what they would examine upon.

Professor MCCALL suggested the withdrawal of the motion. Now that the mistake had been mentioned, the Examiners would probably see that it did not happen again.

The PRESIDENT said it had always happened in the past, and would continue to happen in the future, if some definite plan was not followed; and it frequently occurred that a student was examined upon the same subject at every table with the result that, if he happened to be well up in that particular subject, he passed a brilliant examination; but if, on the contrary, he was deficient in the one point he was rejected, no matter how well up he might be in others; and when a student presented himself at any particular table, anticipating an examination on a certain subject, his equilibrium was as a rule thoroughly upset when questions were put to him on totally different subjects.

Professor PRITCHARD said that was a matter of opinion.

The PRESIDENT replied that it was a fact. He further said that he would alter his motion, so that it should read: "That the Examiners be instructed to draw up a syllabus, and that the syllabus be sent to the various schools." The motion was then put and carried.

Mr. Rutherford's Salary.

The PRESIDENT proposed that the amount paid Mr. Rutherford be increased to £50 for his services to the Board of Examiners in Scotland. His salary now was £31 10s., and for that he had to attend to the examinations at Edinburgh and Glasgow, and was instructed to see that everything in connection with them was carried out properly. An Examiner alone would get, say, £130 during the year, while Mr. Rutherford had only £31 10s.

Professor PRITCHARD acknowledged the apparent excess in favour of the Examiner, but said that to earn the £130 meant leaving business and losing £200. He would second the motion, but he could not allow the President to say that comparatively the Examiners receive three times as much as Mr. Rutherford. Many of them lost a great deal of money by attending the Board.

The PRESIDENT replied that Mr. Rutherford had to neglect his business also to attend to the interests of the College.

Mr. GREAVES supported the motion.

Professor MCCALL could speak to the efficient manner in which Mr. Rutherford discharged his duty, and he was sure deserved well of the College.

The resolution was agreed to.

Notice of Motion.

General Sir F. FITZWYGRAM gave notice that at the next meeting he would move, "That an additional Examiner be appointed to each table."

Obituary.

The SECRETARY reported the deaths that had occurred since the last meeting, amongst them being Mr. James Freeman (Hull) and Mr. S. H. Withers (London).

On the motion of Mr. DRAY, seconded by Mr. SANTY, votes of condolence were passed to Mrs. Freeman and Mrs. Withers, and their respective families, in their bereavement.

The Law of Warranty.

General Sir F. FITZWYGRAM said that as there was a great deal of uncertainty about the law of warranty, he thought it would be a good thing for the Council to appoint a committee to draw up some Bill on the subject, which might be presented to Parliament. The result might be a measure beneficial to buyers and sellers, and creditable to the profession.

The PRESIDENT asked Sir Frederick if he would present a bill on the subject to Parliament, and on his answering in the affirmative it was decided that the subject should be considered at the next meeting.

The proceedings then terminated with a vote of thanks to the President.

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of the Society was held at the Bristol Arms Hotel, Sleaford, on Thursday, the 9th October, 1884, the President, J. Mackinder, Esq., in the chair. Present :—Captain Russell, Grantham ; Mr. J. Hoole, Sleaford ; Mr. Hardy, Sleaford ; Mr. Runciman, Market Deeping ; Mr. T. E. Smith, Market Rasen ; Mr. Gresswell, Peterborough ; Mr. J. Smith, Louth ; Mr. Gooch, Stamford ; Mr. W. Hoole, Heckington; Mr. F. Spencer, Wragby, Hon. Sec. Apologies for non-attendance :—Professor Robertson, London ; Mr. Loft, Grimsby ; Professor Walley, Edinburgh ; Mr. Field, Grimsby ; Mr. Bland, Boston ; Mr. Howse, Lincoln ; Mr. Goodall, Melton ; Mr. Carless, Lincoln ; Mr. Osborne, Fulston.

The minutes having been read and approved, on the motion of Captain RUSSELL it was resolved that Rule vi. be obliterated, and that it be left to the President and Secretary to name the day and hour of future meetings, to suit the convenience and time of the members ; and that the words "last Thursday" be omitted from Rule v., this being a confirmation of the motion passed at the Gainsborough meeting. With reference to the suggested purchase of costly instruments by the Society, for the use of the members, the President said he found at Norwich that the Norfolk Society purchased several of the most expensive instruments, and any members requiring them paid the carriage, and returned them directly after use. Mr. Taylor, of Manchester, stated at the last meeting he did not think they would be often used, but he was sure for country practitioners they would be very useful, especially such an instrument as Santy's tooth forceps. Captain RUSSELL, after a brief discussion, proposed, and Mr. RUNCIMAN seconded, and it was unanimously carried, that the matter of instruments be left to the next meeting, and that it be placed on the agenda paper ; the Treasurer, in the meantime, to look up the subscriptions and submit a statement. A letter was read from Professor Walley, M.P., speaking of the formation of a British Veterinary Club in connection with the new college buildings, and the Secretary was instructed to write to him with a view of obtaining particulars of the scheme.

The following paper was then read by Mr. T. E. SMITH, M.R.C.V.S. Market Rasen, on "Parturition.'

Mr. President and Gentlemen,—At the last meeting of this Society, held at Gainsborough, at which I was sorry so many of our members were unable to be present, Mr. Greaves very kindly came from Manchester and gave us a very interesting and instructive paper on "Glanders in the Horse ; its Nature and Prevention." He suggested, in his closing remarks, that a subject such as parturition would be very interesting to town practitioners, such as him-

self, who saw so few of these cases. As no one at that meeting volunteered a paper for discussion, I have ventured to bring that subject before you to-day, not that I have anything new to speak of, but as these associations are formed for a friendly and impartial exchange of opinion, I hope my few practical remarks may lead to a good discussion, and we may all benefit therefrom. I have heard members of our profession say they would not attend a cow calving, or take a foal from a mare; but in my opinion we, whose lots are cast in country districts, must take cases as they come, and it is our bounden duty to do the best we can to relieve our patients in the most scientific manner and with the infliction of the least possible pain. Of the act of parturition in the natural state, it is useless for me to speak amongst practical men such as yourselves, who are all or mostly engaged in country practice, as it is so well known to you, and to which we are rarely called. It is to the unnatural or abnormal presentations most commonly met with, and the best means to relieve them, I wish for a short time to draw your attention. This subject, gentlemen, in theory is about the easiest I know. Read what work we may, after the description of the case, we are told to put a hook in here or there, pass a cord round the legs, and many other ways, which no doubt are perfectly correct; but in practice, during the twenty-one years I have been connected with the profession, I have not found anything which requires so much common sense, tact, patience and perseverance. I will, with your permission, divide my subject into its various parts, and treat each as I proceed. Before doing so, however, I would like to make these few general suggestions: We must first examine the state of our patient, and if parturient pains are very severe, give a dose of chloral hydrate or other sedative; very carefully examine as to the position of the fœtus, and consider the best means to be adopted for its extraction; have sufficient help and everything ready likely to be required; but never on any account attempt to remove it until righted. The first position to which I shall call your attention is the head presented, and the leg, or legs, doubled back. This to my mind, with ordinary care and manipulation, is one of the most simple we have to deal with. First of all I would say, ascertain the exact position of the legs, whether straight out or under the body, or doubled at the knee.

If the former, pass a cord round the arm, work it down with your fingers to the bend of the knee, draw that gently up until the foot can be reached. When that is practicable, take the foot into the palm of the hand, pass back the fœtus by the head, and gently draw until it can be straightened. If both, treat the other in the same manner. Having succeeded in that, attach cords round each above the fetlocks, use regular but not violent pressure, and you will succeed in extracting the fœtus. I am very fond myself of a pair of pulleys for this purpose. My reason for drawing the foot up by the hand is that it may not be forced, either by the parturient pains or the traction on the cords, through the walls of the uterus, as I have more than once known to take place. In the majority of these cases I am in favour of the standing position, with the hind parts elevated; but of course one must be ruled by circumstances, as it is a thing for which we can lay down no hard and fast line of treatment. Next I will refer to the fore legs, presented with the head doubled back on the body. This is a tedious and very difficult one, which I have found often associated with deformity. In exceptional cases I have know presentations of this kind to be taken away as they are, one particularly in a mare last year. In cases where the head can be reached, pass a cord round the neck as near it as possible, then link a noose from that round the nose or into the mouth, draw gently with one hand until you can get a firm hold with the other round the nose, then work round into position. A case of this kind in a heifer I well remember, where a qualified

veterinary surgeon, after trying in vain for a long time to pull the calf away by the legs, tied a rope fast round the lower part of the neck. Considerable force was applied to this, and the animal pulled about by it, but with no better result. The end was then tied to a post, and the poor beast driven from it by force until the rope broke. The case was then considered hopeless, and the animal was ordered to be destroyed. By the simple means I have here described she was afterwards delivered of her calf, but as you might expect from such treatment, subsequently died. In many cases, however, particularly in mares where the fœtus is large, we can only reach as far as the breast ; we must then draw gently on the legs, skin up to the shoulder, the one on the side the neck is doubled, and dissect it off ; pull the other leg until the neck can be reached ; then treat as before. I have often found a very great advantage in casting the patient on the opposite side to which the neck is bent, also in raising the fore parts until the cords are attached. Many practitioners advocate hooks being inserted into the eyes, jaw, or some other part, but I much prefer the cords as stated. One reason is (at least that is my experience) they are very liable to slip and injure some of the soft structures. Another and very difficult form is what is known as the breech presentation, that is where the hind legs are doubled under the body of the fœtus. I have known cases of this form, where it was found impossible to get the legs into position to pass a cord round the hind parts in front of the points of the ilium and be drawn away. In one severe case of this kind I had in a mare, one leg was dissected off, a hook inserted under the brim of the pelvis, and with the assistance of two or three men, was taken away in that form. The best and most satisfactory, where practicable, is to work a cord below the hocks, push back the body of the fœtus, and draw the legs into the passage. It occasionally happens we have the fore legs and head presented as in the natural position, and when weight is applied to the legs, we cannot pull it away. A careful examination should be made before much force is used, as most probably the hind legs are underneath the body in the passage. Should this be the case, the life of the fœtus must be sacrificed. Cut it in half as far back as possible, cord the hind legs, return the remainder of the body, and take away in that position. In some cases of twins we have legs or parts of each at the same time. These, as in the case of monstrosities, must be treated as they present themselves to us. In a difficult case of this kind in a cow a short time ago, I found great advantage by raising the hind parts by means of pulleys ; in fact, I think I should not have taken the part away without.

One other, and to me very unsatisfactory, presentation is where nothing but the back is to be felt. In the few I have seen, I have found advantage, and generally an altered condition of the fœtus, by casting and turning the animal over. The most difficult case I remember occurred in my practice about ten years ago. The hind legs were laid across the entrance to the passage, with one fore leg over them, which could be reached as far as the knee. It being a valuable mare, and there being little or no prospect of my relieving her, a neighbouring M.R.C.V.S. of many years' practical experience, was called in at my suggestion. After several hours' work, we were only able to get a cord round one hock, but could not move the foal and had the mare destroyed. I have thought the case over many times since, and am of opinion that had it been possible to cut the gastrocnemii tendons, the hocks might have been got up in a flexed position.

During the spring of this year, which, from what I have learned from other members of the profession in my part of the country, was an exceptionally healthy one for foaling mares, I had the following cases, and, as in a great many which come under my care, had very unsatisfactory results :— About five in the morning of the 24th of April, I was called to a mare, the

property of a miller, living about four miles away, said to be foaling, and the foal wrong. I went as quickly as possible, and saw one fore-leg presented, which, I was told, had been some two hours before; on examination, I found the second leg crossed over the neck, and, pressing the head downwards. The mare had very slight pain. I had very little difficulty in raising the head, and, with the assistance of two men, extracted a live fœtus. The mare appeared in good spirits, ate a little mash, and had some gruel afterwards; but the second day was evidently much worse, and both she and the foal died on the third. About seven on Sunday night, the 4th of May, I was sent for to a valuable brood cart mare, the property of a large farmer, said to be suffering from colic, but was near foaling. She had been turned into the orchard during the afternoon, and showed slight pain at times, but nothing of a violent character, or which led them to know the cause. Ordinary colic medicine was administered, but, as the pain did not subside, I was sent for. On examination, I told the owner, I was afraid something was wrong with the foal, but as nothing was presented, I would give a little medicine, and wait to see if the pains increased. He told me the case was in my hands, to do what I considered best, but they had seen nothing put forward. After waiting about half-an-hour, and no improvement, I made an examination, and I found the foal on his back; the hind legs, instead of coming into the vagina, forced up to the spine at each pain. I may say that when I introduced my hand, the mare threw herself down and pained most violently, so much so, that before I could get the legs turned, the rectum was protruded some distance. I returned as much as possible, and took the foal away, but with great difficulty, owing to its size, and the surrounding parts being very much swollen. I administered chloral hydrate, and applied hot fomentations to the abdomen and quarters; but she never rallied, and died in a few hours. A fortnight ago, I had a presentation of this kind in a cow, which, I am pleased to say, is going on well. The third and last case was in a strong half-bred mare, at a farm about three miles from my place. When I drove into the yard, I met the foreman, his arms covered with blood, who told me that a few minutes before, the mare had foaled, and her inside was coming out. I found the presentation to have been the same as in the first case, a fore-leg doubled over the neck. The poor animal was in a most pitiable condition, and had, I was told, with one pain sent out the foal, and with it the uterus and intestines. The latter were trailing on the ground, and as she walked, or rather reeled round the box, was treading on and tearing them to pieces. Of course I was powerless in such a case, and in a few minutes she fell and died. On inquiry, I found she had had slight pains the day before, but showed no signs of foaling until about four in the morning, when I was sent for at once. I should like to have the opinion of the members present, whether or not it is advisable with mares near their time for foaling, to examine them at once, to see if anything is wrong, when the first symptoms of colic appear. I think myself that is the proper time. I should be pleased to have this subject followed up by the diseases most commonly met with about the time of parturition, and hope some members present will volunteer a paper for our next meeting. The two calves, if they may be so called, I have brought for your inspection, were taken by me from a cow, on the 19th July last. On the 18th a message was left at my place, to go over to Osgodby, a village about four miles off, to see a cow the owner thought had a dead calf. Being late home, and not thinking it a case of emergency, I went on the following morning. On my arrival, I found the cow laid comfortably in the stable, chewing her cud, and had it not been for about six inches of membrane hanging from the vagina, should not have thought anything was amiss. I was informed by the owner she was due to calve six weeks before, and at that time her milk came; but as she showed no sign of

calving, or even looked like being in calf, he thought she had a little downfall in her udder. On the morning of the 18th July she stood about by herself, and looked dull, but had no pain; she was shut up, and ate, and drank, as if nothing were the matter. On introducing my hand, I felt a hard substance, but could not make out what it was. With little trouble I took away the two calves together, wrapped in the membranes. The old cow was out again in a day or two, none the worse. During the time she has been in the present owner's possession, she has had twins six times, and three singles; with the previous one, twice twins and one single. Mr. Smith here concluded his paper, amidst applause.

The PRESIDENT: I think this is a subject we all know a good deal about, and I shall be glad to hear any remarks from any of you before I say a few words myself. I meant to have brought a pair of instruments I use for the purpose of taking away cases with the head back, as Mr. Smith has described. They are in the shape of a pair of scissors, and overlap.

Mr. GOOCH said he had several instruments of that description They were larger for a cow than a mare, and differed in length, some being nine inches long.

Capt. RUSSELL said he had listened with the greatest pleasure to the paper, and Mr. Smith deserved great credit for the way in which he had got it up. It was a subject they all knew a great deal about, for as country practitioners they were regularly called to cases of this description, not only in the mare, but in the sheep, pig, and even the dog. He found when called in to a mare or cow, if in much pain, that it was a good thing to administer one ounce of chloral hydrate, six drams to eight drams of water, while you were changing your clothes. It made the animal quieter, and you had not so much pain to contend with, and half your trouble would be removed. There would be more freedom of action and a much more pleasant job: and he had never known bad results ensue—in fact he was of opinion that they were better after it than before it. He expressed his opinion that, with protrusion of the rectum more than six or eight inches, the animal would be almost certain to die, even if it were put back. Mr. Smith did not mention among others the twist of the uterus. In a case he was called to, he could only get his hand in six or eight inches, and he came to the conclusion that the uterus was twisted. He tried several ways to undo it. He turned the animal over both ways several times, but could not get the twist undone, nor the calf away. The animal was destroyed, and he found a double twist of the uterus, which was completely over twice. As to examining an animal seized with colic pains shortly before the period was present, you would be perfectly justified in making an examination, at all events *per rectum*, as to the position of the foal. He should be very happy to accept the challenge of his friend, Mr. Smith, and would, if they wished it, prepare a paper on the ordinary diseases incidental to parturition. (Hear, hear.)

Mr. HARDY stated that he had two cases of protrusion of the rectum beyond six or eight inches last year, and one died in forty-eight hours. In the other, he found the mare had foaled, and there was protrusion of the rectum from ten to twelve inches. The man had tried to force it back at the time the mare was foaling, and had so far succeeded that when his assistant left there seemed nothing the matter with the mare. He was sent for again the next day, because there was no action of the bowels. The mare was then showing no abdominal pain, but the bowels did not act. She was in this way for eight days, and then she got all right. He might relate a case of a heifer he was called in to, showing symptoms of calving. She had been bulled about six months, and we could find more legs than we ought. There were two calves attached at the spine, two heads, eight legs, two tails, and the thoracic

and abdominal cavities were quite separate. The attachment began at the front of the shoulders, and terminated at the hips.

Capt. RUSSELL asked the President whether in his opinion these cases of deformity were more common in certain localities than others. He had been in practice thirteen years, and had had many cases of parturition, as they bred a good deal of stock in his district, but he had seen very few instances of deformity in the fœtus.

The PRESIDENT thought there was a great deal in the feeding of the animals. They would find more deformity in cart mares than in harness mares. In one case of parturition he attended there was only some six inches opening between the H's, and he was told he should have performed the Cæsarian operation, and in this case, a cow three parts meat, the best plan was to slaughter.

Capt. RUSSELL described the Cæsarian operation as performed by him. He was called in to see a cow, and found a portion of the ischium was projecting backwards and sticking up like a spike. The cow began calving some five weeks after, and he found this jagged piece of bone was preventing calf from getting away. Finding it impossible to get the calf away without killing both cow and calf, he made a long incision right through the flank, through the muscular tissues down to the uterus. The place was like a slaughter-house immediately, and he seemed to have severed several large vessels. He opened the uterus and took out the calf, and immediately cut the cow's throat. He had read of these operations being performed on the Continent with much success, but he could not understand how that was, if there was always such an enormous quantity of blood as in this case.

Mr. HARDY did not remember having much hæmorrhage when he took the calf away, though he killed the cow directly after.

Mr. GRESSWELL narrated a case of parturition in a mare when the forelegs were presented, which he successfully performed. The mare went on wonderfully well, but the foal was dead. He had had two or three similar cases.

Mr. HARDY asked if the meeting did not think they had more cases of this kind in shafting horses dragging manure carts and heavy loads where there were sudden strains.

Capt. RUSSELL asked if they were justified altogether in thinking these cases were the result of accident, or whether these deformities were not the result of the peculiar idiosyncrasy of the animal itself. They would see a mare in foal lie down and roll over and over, and yet how many cases of deformity did they find from this. He narrated an extraordinary case of facial deformity in a hunter, through its head having been turned in the uterus and laid on the spine of the scapula.

The PRESIDENT said this year they had had in his district more breech presentations than he had ever had in his life before.

Mr. RUNCIMAN asked if it was not the President's experience that breech presentations were generally dead.

The PRESIDENT: No, not as they start; but they die before we get them away.

Mr. RUNCIMAN said in many cases they found a decomposed foal.

The PRESIDENT said the reason they were dead was because they were given more time. A mare with a breech presentation did not strain so much as at other times.

The SECRETARY said he had a case in a heifer of twins, a month ago, with a breech presentation. He went into the house after taking one away, the other being a breech presentation, and it had been dead three or four days.

Capt. RUSSELL asked the Secretary if he thought that was by a former impregnation.

The SECRETARY answered, No; she had only been to the bull once.

Mr. SMITH asked whether the formation of the country had anything to do with these cases, and cited his experience, which was that in fields, hilly and full of holes, such were often to be met with.

Capt. Russell and the President related further experiences, and Mr. Gooch stated he was in the habit of severing the gastrocnemii muscles in certain cases. Captain Russell further said that he always gave a dose of physic after difficult cases of parturition.

Mr. GRESSWELL: I don't agree to that.

Capt. RUSSELL: If you give them four or five drams of aloes, you'll find they will go on all right and do better.

Mr. SMITH said it acted as a febrifuge.

After further discussion, the PRESIDENT asked Mr. Smith if he had anything to say in reply.

Mr. SMITH: Nothing; except to thank you for the kind manner in which you have discussed this question. I am sure I have learnt a little and hope we all have.

Capt. RUSSELL proposed, and Mr. GRESSWELL seconded, a vote of thanks to Mr. Smith for his paper. Carried *nem. con.* It was decided, should Professor Wally be able to read a paper, that the next meeting should be at Grantham, and if not, either at Louth or Market Rasen, the President and Secretary to make the final arrangements. F. SPENCER, *Hon. Sec.*

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the above Association was held at the "Rose and Crown," Tunbridge, the 29th Sept. Mr. F. W. WRAGG, of London, presided, and there were also present:—Messrs. J. B. Martin (Rochester), E. A. Hollingham (Redhill), Hon. Sec.; W. Covenay (Headcorn), P. Gregory (Tunbridge), W. Cawthron (Hadlow), &c. The attendance was small.

The minutes of the last meeting, held at Windsor, having been confirmed, the Hon. Sec. reported that he had received letters from Messrs. Holman, Stock, Welsby, Edgar, Rock, H. Hogben, and F. C. Hogben, regretting their inability to attend, in consequence of pressure of business. He next read a letter stating that Dr. Fleming had been taken suddenly ill whilst on a tour of inspection in Ireland, but that he was progressing very favourably.

The HON. SECRETARY said that after the meeting at Windsor he was directed by the Association to write to Mr. S. L. Simpson, acknowledging their appreciation of his kindness towards them on that occasion, and thanking him for the manner in which he entertained them there. He now read Mr. Simpson's reply, in which Mr. Simpson said he was only too glad to have the opportunity of being of service to the Association, and it would always be a source of gratification to him to see the members at any time they thought proper to make Windsor a place of meeting.

On the Breeding of Horses.

The next matter before the meeting was the above, on which Mr. Martin had very kindly offered to read a paper. The PRESIDENT, however, said he thought it would be almost a pity that so good a subject should be gone into with so few members present, in which feeling the meeting generally concurred. Mr. Martin, however, without reading his paper, quoted one or two extracts from it, and offered some valuable observations thereupon, as will be gathered hereafter.

Mr. MARTIN, in the course of his remarks, called attention to the Rochester Cart-Horse Stallion Society, for improving the breed of cart-horses. The shares, he said, were readily and cordially taken up and they paid five per cent. every year, and although that was not much, the real object for which the Society was established was to keep a good, serviceable pedigree stallion in their district, and no doubt the farmers would be able to supply the London market with really first-class animals. The principle was one that ought to impress itself on the farmers in every district. If farmers were, as was alleged, not intelligent, they showed a greater desire and more energy to advance their own interests and position than veterinary surgeons. The latter ought to be able to urge upon the farmers the importance of having a first-class stallion in their district, and to show them the class of animal they required. The interests of the two classes were identical ; if farmers were doing badly, the veterinary surgeons were doing badly also. If it did not now really pay to grow wheat, the breeding of cart-horses for the London market, where they could realise £80 each, would be a great source of profit to farmers in places where there were meadow lands; and, therefore, he considered the veterinary profession might be of much use to the agriculturists in this matter. What impressed this question upon him in the first instance in the Rochester district was that farmers were using all sorts of mares, without exercising the least discrimination in the selection of them, or in the selection of the stallion either. A mare, however unsound, was put to any little weedy cart-horse that happened to be travelling in the district at a fee of about a sovereign, and the result was that at about five years old the colt was worth about £35 ; whereas, with ordinary intelligence in the selection of mares and the sire, they could raise good cart colts which could be worked up to six or seven years old, and then supplied to the London market at, as he said, about £80, which would be a remunerative price. Veterinary surgeons should be in a position to give farmers in the district proper information, and that was the reason he wrote this paper "On the Breeding of Horses." His opinion was that in the south veterinary surgeons had partaken of the apathy of the farmers, and that they would rather sit quietly at home and smoke their pipes than pay a little more attention to the advancement of veterinary science. That was what he really thought about them. There was no encouragement for anyone to read a paper ; the members of the profession would not attend. Veterinary surgeons should write papers for farmers' clubs, and thus advance their reputation, and raise themselves in the estimation of the public, and show that they were useful citizens. Mr. Martin concluded by saying that if they could induce farmers to form a company, and keep a first-class stallion in the district, they would be conferring a great benefit.

The PRESIDENT said he thought with Mr. Martin that these practical papers do a great deal of good.

Mr. MARTIN : You raise the profession on an equality with the farmers.

It was generally agreed by the meeting that the views expressed by Mr. Martin were a move in the right direction, the PRESIDENT at the same time remarking that the thing was to get farmers to breed from young mares as well as carefully selected ones.

Mr. GREGORY asked Mr. Martin if he showed in his paper how to tell for certain whether a mare is in foal or not.

Mr. MARTIN : I don't tell you that. Can you tell ? I bought a mare last spring that was going to foal, but she has not foaled yet. (Laughter.)

Mr. GREGORY : We had so many mares in the district that showed all the symptoms of foaling.

Mr. MARTIN, with respect to the Rochester Society, said they had got £300 or £400 in the bank, and they thought about extending the district with

the present sire horse, and buying a Clydesdale to change the breed. He pointed out that it was not a matter altogether of what they paid, it was the principle of improving the breed in the district.

The PRESIDENT : It is more than five per cent., if you take into consideration the return they would get for a better breed of cart-horses.

Mr. MARTIN : My object was to get the farmers to take an interest in their own horses.

The PRESIDENT said no doubt better cart-horses would be obtained now, through the efforts of the English Cart-Horse Society.

Mr. MARTIN : But you want them in all districts. I know for a fact there are a number of horses travelling in our district, and also in other districts, that are roarers, side-boned, and broken-winded, and the public don't know it ; if there is a horse travelling there, and the fee for service is only a guinea, they would rather put a mare to that horse with no pedigree, and risk its unsoundness, than pay two guineas for a sound pedigree stallion that would cost about 400 guineas. If you could form a company in different districts, and get the farmers to take a share in it, they would feel an interest in their own horses. How this horse of ours at Rochester pays is this : To every farmer he goes to we know exactly how many mares he serves, and while there the horse is kept by the farmer, and the man in charge of the stallion, too. We send round a card stating where the horse will be on certain days. We do not allow him to serve strangers' mares under a subscription fee of three guineas, those holding shares in the society paying two guineas. If you give 350 guineas for a horse you must charge for him, and if he serves 100 mares at two guineas each, it pays. Then one of the farmers works the horse all the winter and we discharge the man, and when the horse comes on for service again we take the man on, and the expenses go on.

The PRESIDENT : The horse really costs you nothing in the winter ?

Mr. MARTIN : No, he goes and earns his living.

Mr. GREGORY : It is the right idea, and a move in the right direction ; there is no doubt about that.

Mr. MARTIN remarked that without pedigree, soundness, and size, good stock could not be ensured.

Mr. GREGORY : You want the farmers to breed from good mares as well ?

Mr. HOLLINGHAM : The fact of it is they seem to think that after a mare is fit for nothing else, she is fit to breed from.

Mr. GREGORY : They say we are not often right, but they are beginning to see that now. One man I know always used to breed from old mares, but he does not do so now. He breeds from three to six-year-olds, and then puts them into hard timber work, and they go and stand it then.

Mr. MARTIN said it was the province of veterinary surgeons to advise them against breeding from old mares.

Mr. HOLLINGHAM : And they thank you very often for the information you give.

Mr. MARTIN : But they must know it is right. This is a wealthy district with hops and fruit ; but corn is at a low price, and wherever corn is grown it must pay to breed cart-horses.

Mr. GREGORY remarked that hops do not always pay.

Mr. HOLLINGHAM : You can generally make them, if you have got money enough to spend on them.

Mr. MARTIN : If you can average £80 apiece for horses at five years old, breeding must pay. Lots of good dray-horses fetch 100 guineas in London.

The discussion then ended, an earnest hope being expressed that Mr. Martin would read his paper another time, and that he might have as large an attendance of members to hear it as the interesting subject deserves.

Fat Stock.

Mr. GREGORY incidentally remarked that he thought a great mistake was made in sending stock to shows so fat; and yet it was no use sending animals in a useful breeding condition—they were not looked at.

Mr. MARTIN: That is a little want of discretion on the part of the judges. A fat animal is taking to the eye.

The Next Meeting.

Mr. MARTIN stated that he wrote to Mr. Edgar, asking him if he would favour them with the paper for the next meeting in March, and he had kindly promised to read one on "*Bovis Mammitis Garget.*"

On the motion of Mr. Martin, seconded by Mr. Cawthron, it was resolved that the next meeting of the Association be held in London, and that the Central Veterinary Medical Association be invited to meet them.

The business concluded with a cordial vote of thanks to the President, who, in acknowledging the compliment, said he only wished he had had a larger meeting to preside over.

The members, joined by a number of friends from Rochester, afterwards dined together at the hotel, a first-class repast being provided. The chair was taken by Mr. Wragg, who, in response to the toast of his health, proposed by Mr. Stace, returned thanks for the kind way in which he had been referred to as the head of that day's proceedings.

Mr. HOLLINGHAM gave "The Visitors," and said although on the present occasion the members of the Association were outnumbered by two, or three or four to one, he hoped their friends would not go away with the idea that that was their usual style of doing things. As it was, there was a fairly good muster between them; and if those gentlemen present did the Association the honour and pleasure of attending another of its meetings, he trusted they would not be in the majority. He begged to couple with the toast the name of Mr. Ballard, who suitably responded.

The PRESIDENT, in giving the next toast, said he had never been to a meeting of this Association without finding his old friend, Mr. Martin, there. He could assure them that Mr. Martin was a good man and true, both inside and outside of the profession, and the Society's present efficient condition, which enabled it both to hold its own with the other and larger and older associations, was mainly due to his indefatigable exertions. He, therefore, had great pleasure in proposing the health of Mr. Martin.

Mr. MARTIN, in reply, said he had the welfare of the profession at heart, and endeavoured, as far as he possibly could, to advance its interests, and to infuse a similar spirit in all the other members, to induce them to exercise their energy and influence in the direction of making themselves really scientific men, and taking those gigantic strides such as Dr. Fleming and others had done. He specially mentioned Dr. Fleming, who, through his energy, perseverance and hard work, combined with keen perception—all characteristic of Scotchmen—had conferred a great benefit on the profession. Scotchmen always tried to rise to the top of the tree, and Dr. Fleming was an eminent example of that; he was always seeking out, in conversation or otherwise, anything of a practical nature, and was one of the best-read men in the profession he (Mr. Martin) ever knew. Comparing the northern men with the southerners, the latter were not in it. He again commented upon the apathy displayed by veterinary surgeons in their own profession and interests; and remarking upon the fact that it took one several hours to write a paper, and that then, though close at home, members did not take the trouble to attend, he said it was a disgrace. In other counties where the Association had met, whether in Sussex or Berkshire,

or in London, they always had excellent meetings ; the Londoners rallied round them in a very hearty manner. With regard to the President, Mr. Wragg always honoured them with his presence, and likewise showed his interest in the profession by doing anything he could in its behalf.

The company then separated.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the County Hotel, Newcastle-on-Tyne, on August 29th. In the absence of the President, the chair was occupied by D. Dudgeon, Esq. (Sunderland).

Present:—Messrs. Grieve, Blaydon ; Nisbet, Fence Houses; Mulvey, Bishop Auckland ; Hy. Hunter, A. Hunter, Gresty ; Wm. Hunter, and the Secretary, Newcastle-on-Tyne.

Messrs. Drake and Winteringham were present as visitors.

The minutes of the previous meeting having been read and confirmed, Mr. Drake, M.R.C.V.S., Stanhope, was proposed as a member of the Association.

Mr. H. HUNTER narrated a case of Epilepsy in a horse that was recently under his treatment. The animal's temperature was 106°, pulse 85. The mouth was drawn on one side, and the animal usually had a fit when startled. The treatment consisted of oil and chloral hydrate in the first instance, but afterwards more benefit was derived from Liq. Ammon. Acet. and Ether Nit. The animal subsequently recovered and did well.

Messrs. DUDGEON and MULVEY stated that they had successfully treated similar cases.

Mr. NISBET mentioned that he had under treatment a young pony that invariably had fits when startled. As the animal's age increased the fits became more violent, and the pony was destroyed, the case being considered hopeless.

Mr. A. HUNTER then read a most exhaustive and practical paper on "Diseases of and Accidents to the Horse's Foot." An animated and interesting discussion followed, in which all present took part.

The CHAIRMAN proposed, and it was unanimously carried, that the further discussion on Mr. Hunter's paper be adjourned to next meeting, when Mr. Nisbet will reopen it with some remarks on Laminitis.

Votes of thanks to Mr. Hunter for his paper, and to the Chairman for presiding, brought the meeting to a close.

WILLIAM W. SMART, *Hon. Sec.*

THE MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of members of this Association took place at the Ram Hotel, Gloucester, on September 26th. The President, Mr. H. M. Stanley, Birmingham, occupied the chair.

There were also present, Messrs. H. Olver, Tamworth ; T. Greaves, Manchester ; J. Malcome, Birmingham ; James S. Barling, Hereford ; W. C. Barling, Newnham ; F. W. Barling, Ross ; E. Meek, Walsall ; T. W. Wragg, London ; S. G. Merrick, Northampton ; H. D. Pritchard, Wolverhampton ; E. Beddard, Wolverhampton ; and H. J. Cartwright, Wolverhampton.

The SECRETARY read letters of apology for non-attendance from the following members : Messrs. F. Blakeway, Stourbridge ; Prof. S. Walley, Edinburgh ; G. Rossell, Sandiacre ; L. C. Tipper, Balsall Heath ; J. G. Cross, Shrewsbury ; J. E. Pitt, Birmingham ; H. Blunt, Lutterworth ; H. R. Perrins,

Worcester; J. Wiggins, Market Harborough; W. Carless, Stafford; and O. J. Hills, Leamington.

The minutes of the last meeting were read and confirmed.

Meeting of National Association in Birmingham.

The PRESIDENT reminded the meeting that the National Veterinary Medical Association proposed holding their next annual meeting in Birmingham, and he trusted members of the Midland Counties Association would endeavour to make the event a success. He invited them to become members of the National Association. (The annual subscription is half-a-guinea.)

Mr. OLVER, at the invitation of the Chairman, referred to the meeting of the National Association, which he said had done him the honour of electing him President. Vice-Presidents had been proposed and a provisional Committee selected. He hoped the National Society at its next meeting would be well supported, as he believed the institution existed for the benefit of the profession. They derived intellectual as well as social benefit from attending such gatherings.

The next Place of Meeting.

Mr. MEEK proposed, and Mr. PRITCHARD seconded, that the next meeting of the Midland Counties Veterinary Association should take place at Walsall.

The CHAIRMAN read a letter from Mr. Blakeway suggesting that the next meeting should be held at Nottingham.

It was unanimously decided to adopt the former proposition.

The CHAIRMAN announced that Professor Walley, Edinburgh, had promised to read a paper at the next meeting.

New Members.

The following gentlemen were proposed as members of the Association: Mr. BEDDARD proposed and Mr. MEEK seconded Mr. Banbridge, of Wellingborough; Mr. OLVER proposed and Mr. MALCOME seconded Mr. Moir, of Cardiff; Mr. J. S. BARLING proposed and Mr. T. W. BARLING seconded Mr. S. Pritchard, of Hereford; Mr. BEDDARD proposed and Mr. MERRICK seconded Mr. Aris, of Wellingborough.

The proposals were agreed to.

Mr. T. GREAVES, Manchester, then read the following paper:—

Glanders in the Horse; its Nature and Prevention.

Glanders is an ancient phraseology. It ever has been, and still is looked upon as the most malignant, terrible, and dangerous disease the horse is subject to. Unlike almost every other disease, if the glander microbe gets imported, or imbibed into the system by any means whatever, its effects in nearly every case are mortal. Influenza, Pneumonia, Enteritis, Hepatitis, and a host of other diseases may attack the system even in the most virulent form and subside again, leaving not a trace behind. But if the real disease-producing element or poison of Glanders, or Farcy, enters the system it is never eradicated; in some constitutions it may wither and not fructify. There is an irregularity and uncertainty in the period of incubation, and some obscurity about it; the patient may rally apparently for a time, when enjoying genial and favourable conditions; the horse may live an indefinite period in an apparently healthy state and the disease be unsuspected, but sooner or later the small living micro-organisms, which really constitute the disease and which are all

the time lying latent, will, when subjected to extremes of heat and cold, suddenly become resuscitated and manifest their full vitality. An active ferment is set up, the poison-germs are cultivated in the whole system, assuming a deadly form, creating a loathsome, virulent, and putrefying condition of every tissue in the body, and if not destroyed, in nearly every case death mercifully puts an end to his sufferings.

I have said that a patient may rally for a time when enjoying favourable conditions; he may live an indefinite period in an apparently healthy state. I will illustrate what I mean by relating two or three cases. One, a chestnut cart-mare from out of a stable that never had a case of Glanders in it before; she was in middle age, in regular work, and in fair working condition. The disease began by slow degrees, she fell off her eating and condition; in two or three weeks we were requested to examine her; there appeared some trifling constitutional derangement, but the symptoms indicated no particular ailment; she had some simple alterative medicine, then a course of tonic medicine, teeth were rasped and various changes of food, and kept at easy work; still no improvement, but, on the contrary, became poorer and poorer, weaker and weaker; she had a slight nasal discharge and enlarged glands, great depression of spirits, eyes sunken, and gummy discharge from them—suspicious indications; pulse, breathing, and temperature nearly normal; she could scarcely get along and was obliged to give up work; up to this time there was only a slight discharge from the nostrils or tumefied glands. The Schneiderian membrane was perfectly free from ulcers and of a pallid hue, but she had no strength of lungs, the cough was full and hollow. She had now been ailing about six or eight weeks; she had been kept isolated all the time. At this stage it suddenly assumed a very aggravated form, ulcers in her nostrils, farcy buds, and corded absorbents in various parts of her body made their appearance, the tumefied glands increased in size. I gave an emphatic opinion that the case was hopeless, and advised that she be destroyed. The owner begged that she might be sent into the country to a paddock where she could be taken up at nights; it being summer-time this was done, and she was to take her chance, when, lo and behold, she began to recover, and in two months there was no sign of Glanders or Farcy, nasal discharge having entirely ceased and glands gone completely away. The mare had grown and thickened and bellied, and was in excellent spirits. She was brought back and kept to herself, and put to easy work. She kept on for several weeks, when she began to fall away again, and every symptom returned; she was again sent out to the same place in the country. She did not rally this time; in a few weeks she sank and died.

The second case was a young, well-bred, valuable horse. He had a discharge from his nostrils and tumefied glands—glands as large as walnuts—for a long time; he had all kinds of medicine, blisters to his throat and face repeatedly, trephined over and over again, teeth punched out, etc., with little or no improvement; the Schneiderian membrane for two years perfectly clear of ulcers; always eating well, mostly in good and fine condition, in excellent spirits; the glands had subsided to the size of peas, could work well, his lungs could endure exertion, and he could cough a good, strong, shrill cough. These two last conditions *I always look upon as a crucial test in critical or doubtful cases*, next to inoculation as a matter of certainty. If a horse has miliary tubercles in his lungs he cannot cough a shrill cough, or endure exertion. By this time he was turned out to grass; it happened to be a cold, wet season; he was starved and perished. He came home very much reduced in his condition, he gradually sank, Glanders and Farcy showed themselves in a virulent form, and he died. Had he not been subjected to this exposure he might have lived for months or years, and disease latent in him all the time.

I have seen cases in which scores of Farcy buds existed, and corded

absorbents, and nostrils covered with true chancre ulcers, and tumefied glands, and in whose lungs there were not the slightest appearance of miliary tubercles. You will see by this that even virulent Glanders and Farcy may exist in some cases, and yet the vital organs be not implicated; in such cases the animals may live for years, although the disease is in them.

My contention is that had these horses which I have referred to continued where they improved so remarkably, where the climate, stables, and conditions were so genial to them, the seeds of disease would have lain quiescent, dormant, in them for months or years, and the disease escape detection or identification; but that the seeds of the disease could become resuscitated and the active ferment set up again at any time if they were placed in altered conditions of extreme heat or cold favourable to the cultivation or reviving of the Glanders germs, which still existed and lurking within them, for it must be remembered these Glanders germs possess a strong vitality. I care not whether those altered conditions are in the hold of a vessel, in a new stable, or in a brigade encamped in the open air, Glanders in its most virulent form would have been developed or resuscitated in those horses, and they would contaminate the air of a whole stable, or ship's hold, in a few hours to such a degree that every horse susceptible to the disease, breathing the same air, would become affected, and an outbreak of Glanders in its most malignant form be the inevitable result. An original germ can, in an incredibly short space of time, give rise to successive generations of germs. A germ is nothing more than a particle of living matter, and every single spore of the millions contained in diseased blood is competent to produce malignant disease in a susceptible subject.

Yea, gentlemen, the germs or microbes of Glanders can lay latent in other conditions, in other habitats than in the animal organisms. Percivall, in his "Hippopathology," gives an example at Lisbon, "where Glanders broke out amongst the troop horses with such virulence that the stables were obliged to be shut up, *locked up for thirty years*, but from the circumstances of another war they were again opened, and then, from the infection having remained in the stables all the time, the horses that were put into them became immediately glandered, the active principle was retained, we do not know for how long before, nor for how long since." Here arises one of the most interesting questions that can occupy the mind of the physiologist; it is a problem worthy of our greatest intellects to try to solve, viz., were these micro-organisms which produced Glanders in the latter horses the same micro-organisms that produced the disease thirty years before, or had there been a succession of generations of these micro-organisms during the whole of this period of thirty years? We see the germs sustained vitality throughout the vicissitudes of heat and cold during this long period. Our pathological knowledge of Glanders is by no means complete; we want more clear knowledge, it has become of urgent practical importance. It is not my intention to give you the symptoms, or any method by treatment, since I believe such would only be a waste of your time. I shall, however, ask you to give me your earnest attention for a short time while I discuss the question of the cause of Glanders and Farcy, and then we will consider the best means we possess of preventing it, and if, unfortunately, it has gained access in a stable, the best means of confining its ravages.

I believe the cause of Glanders and Farcy to be in every instance referable to contagion, that there must be a specific Glander poison or Glander germ to produce Glanders, that this specific poison or germ can only produce this disease; it can produce no other disease, and no other poison or germ can produce Glanders, only the living can give rise to the living. I should as soon expect to see a blade of wheat or oat spring out of the earth without the grain of wheat or oat having been placed there. Would you not stand

amazed, and doubt the evidence of your own senses, if you saw a whole field of wheat, oats, or potatoes spring up out of the earth without any seed having been planted, or would you be less amazed to see children and all kinds of animals born spontaneously without parents? The analogy holds good in every particular.

Professor Gamgee says, "But certain it is that the laws of procreation are as clearly obeyed in the propagation of a virus, of an animal poison, of that which kills a mare or an ox as in the reproduction of animals themselves." Can you expect an oak sapling to spring up out of the ground without an acorn at the root of it? Perhaps you may say, Yes, I can; and you may think that you have me on this point; you may say, I can do without the acorn to produce the oak sapling. I can plant a slip of oak in favourable soil, and it will take root and grow, or I can graft a slip of one tree into another and it will grow, and in like manner I can do without germ or seed. I would ask, Do you think this proves your case, that no germ is required? is it not by your own showing absolutely necessary that you set the oak slip to produce the oak tree, or graft the rose slip to produce the rose tree? In like manner it is absolutely necessary we must have implanted in the system the Glanders germ to produce Glanders; the quantity may have been very minute and imbibed months before. Do you think it is crushing argument against my theory, that if it is contagious every horse in the stable shall become alike affected? is it not an admitted fact that the difference in degree of susceptibility in animals is as wide as the Poles? have we not a host of evidence substantiating its authority? I presume no one will have the temerity to argue, that because every horse in a stable happens not to catch the disease where Glanders is in the stable, that therefore Glanders is not contagious. Such would be fallacious reasoning indeed; germs imbibed into the system of non-susceptible constitutions may wither and die, like seeds sown in unfavourable soil; such seed withers and dies, it cannot fructify.

Mr. Hunting says, that "Of every hundred cases of Glanders ninety-nine are unmistakably due to contagion, and probably the hundredth is traceable to the same cause, if we only could follow the hidden mode of communication." Percivall, in his "Hippopathology," shows this different degree of susceptibility in different individuals very clearly when he says, "Six healthy men shall have intercourse with the same diseased individual woman, and it shall happen that but one or two of the men shall take the venereal disease, the remaining four or five shall escape," does this prove that it is not contagious? Again, because Glanders breaks out occasionally in a foul, ill-ventilated stable, is that a proof that it is the foul stable and not contagion from which it has emanated? I am certain it is not; it depends upon other conditions. I can tell you that I have known many foul stables where the miasma and strong smells were intolerable and had been so for years, but in them Glanders had fortunately never been known, but in which Influenza, chest disease, etc., rode ramoant; and in other stables where the ventilation and drainage could not be found fault with, they being sweet and healthy, there Glanders had had a transient existence; are we then to condemn the sweet, well-ventilated stable, and laud the foul stable? No such thing; depend upon it if Glanders broke out in both these stables, from some infected animal entering them, the horses in the former stable might live, but in the latter they would die like rotten sheep. I have known Diabetes to reduce a horse to attenuation and death, without Glanders or Farcy supervening, and in other stables affected with Glanders poison they have all died of Farcy following Diabetes.

I believe that germs, Bacteria, Bacilli, or microbes of any species, in certain conditions, may be so cultivated that they shall become more powerful,

malignant, and virulent, or under other conditions these same germs, Bacteria, Bacilli, or microbes may be so weakened that they can scarcely produce any effect whatsoever; but I do not believe that they can be changed in their nature—that is, their species or individuality changed. I am not quite sure whether the Glanders germ may not be capable of being transmitted or be hereditary. I have a full and confident belief in the advancement of science, and that microscopes and other means will in time advance to that state of perfection that the bacillous germ or microbe of Glanders, and that of Smallpox, and that of Cattle Plague, and all other infectious diseases, will be detected, and known with a distinctness, an individuality, and certainty, and that it will be found that they are as different as is the spider and the common house-fly.

We will now consider the best means at our disposal to prevent the disease. The consideration of the first and greatest importance is, the most careful avoidance of coming near any diseased animal, both indoors and out of doors, and going into an infected stable, or allowing other horses coming into your stables; next in point of importance is the character of the atmosphere in the stable in which your horses live, see that it is free from pollution or miasma from foul drains; have surface drainage, if possible; have your ventilation on correct principles, have a current of air right through the stable, if possible—not too much to starve your horses, for no horses will thrive or feel comfortable in a cold stable; nor let it be too warm or confined. Sanitary science is all important; sprinkle quicklime all over the floor twice a week; keep your stables of a nice, comfortable, genial temperature; good sweet wholesome food, good water, not over-worked, great care taken of them, both in the stable and while out in their work. All these points vigilantly, diligently, and constantly attended to, will ensure an immunity from Glanders, the contagia or micro-organisms having been effectually destroyed or so weakened as to be quite innocuous; but supposing the disease has indeed gained an entrance into your stables—suppose one of the horses which was of susceptible nature had inadvertently been put in a stable which was infected with Glanders poison, he imbibes it, and in a very short time he becomes ill, and it shows itself in a malignant form; or suppose the observance of the rules had been neglected, and some other horse has been allowed to stand in your stable for a few hours or a few nights, and such horse was at the time suffering from the disease, or you may have purchased a new horse, which was suffering from the disease in some insidious form which you entirely unsuspected—in either case the glander germ or microbe has been let loose in that stable, and if such animal continues in the stable for a few days or nights, depend upon it, it is a centre of infection; the real disease-producing element radiates. I believe it differs vastly in its degree of virulency and deadly effect; every horse in the stable imbibes more or less of it. It is natural to infer that those horses standing nearest to the infected horse would be likely to imbibe the largest quantity; but these horses may not be the most susceptible, or scarcely susceptible at all; others at a distance in the same stable, but more susceptible, will become affected first; perhaps it may have existed a week or two before it is detected, and has by this time permeated all the air in the stable and got a good hold; it will require energetic and decisive steps to be taken if the hideous monster is to be ejected. Now what is the best course to pursue? First, have the affected horse or horses removed at once; if they are decided cases they should be destroyed, if they are not bad cases they can be removed to a distance and kept completely isolated. Secondly, have the stalls they occupied thoroughly cleansed; this consists in having the manger, rack, boskins, and wall well washed with boiling water, McDougall's soap and brush; put a white-hot fire in a movable grate in these stalls an hour at a time, twice a day for a week. Thirdly, fumigate

every stall in the stable with carbolic acid fumes every day for a week, and then twice a week for a month. Fourthly, let every horse in the stable be carefully and strictly examined all over for any symptoms of Glanders or Farcy; this examination should be done twice a week for a month, by the veterinary surgeon himself; extra care should be taken of every horse; when brought in at night they should be made warm and comfortable before being left for the night; see that they have none but sweet wholesome hay, and corn, and water. By a strict observance of these rules, you may in nearly every case effectually stop its further progress, and get rid of this frightful disease, and I fully believe every infected stable may be made clean by these means.

In conclusion, I wish to make a few remarks on the law as it affects Glanders. The law says a man must give notice to the police of his having Glanders in his stud; the penalty for not doing it is £20 or three months' imprisonment. He can agree to have such slaughtered; if he refuses, the authorities can give him notice and have the horse destroyed. If he moves a glanderous animal into the public street he is liable to a fine. The local authority can prevent the movement of all horses out of a stable in which a glandered horse has been standing; this would be in many cases an immense inconvenience and a great hardship; in fact, it would be simply ruin to the owner; he may sell any other horse out of the stable not apparently diseased, although it may be only passing through the stages of incubation. Now to detect and destroy each centre of contagion, and thus prevent its spread, we should have a strict law compelling all slaughterhouse owners or keepers of kennels to keep a register, and to make a return of all glandered horses coming into their hands, and state candidly and honestly where they come from. This they do not do; they only return such as are sent to them by the inspector, and they argue that the other cases are unrecognised by them. We cannot force men to see, but we might prevent them from killing any horse with a discharge from his nose, or with suspicious sores on his body or limbs, until examined by the inspector or veterinary surgeon. By these means, and by a constant and diligent supervision of slaughterhouses, every glandered stable in the kingdom would become known to the authorities, and all such stables compelled by law to have surface drainage and the process of cleansing and ventilation I have indicated. Glanders and Farcy in England, instead of being on the increase, as it is at the present time, would become a thing of the past.

Gentlemen, I have done. Let us not take an enervating or a melancholy view of our noble profession; let us not see time passing away without being put to its full value. Surely in a matter of this important kind we should endeavour to do something, that we may say that we have lived, that we have not lived in vain, that we may leave some impress of ourselves on the sands of time. My earnest advice to each and all is, "Go, labour on."

The Discussion.

The CHAIRMAN having remarked that the subject introduced by Mr. Greaves required a great deal of consideration, he invited discussion.

Mr. F. L. BARLING mentioned a curious case which had come under his personal observation. A gentleman owned five or six horses, which he had as well kept as any in England. His stables he had not only had cleaned but partially rebuilt; last year the legs of one of them, a fine chestnut, were found to be very much swollen; the animal was miserably dejected. It had a peculiar laboured breathing, with a slight symptom of cough; some indications of Farcy were visible. Four days afterwards the legs had burst open in a hundred places. A more negligent case of Glanders he never saw, and the animal had to be shot. He would like to ask Mr. Greaves how he would

account for the outbreak. More complete or better ventilated stables could not be.

Mr. GREAVES said he had known similar cases, and he believed that in every instance, if careful investigation were made, it would be found that the disease was the result of contagion. Probably, if a horse had not been in actual contact with a diseased animal, it had been in a stable where a diseased animal had been stabled. Under these circumstances only the most susceptible horses became affected. Probably three or four others would not do so, but every case was the result of glanderous matter being imbibed.

Mr. OLVER remembered a case in which two colts were affected, one with Glanders and the other with Farcy. As they had never been off a farm or in a stable, or even crossed the public road, it was a case which suggested spontaneous origin. Referring to disinfection of buildings, Mr. Olver said he did not believe in fumigation or the use of limewash. He had a particularly strong objection to whitewash, because he believed it only covered up instead of destroying the germs of disease. (Hear, hear.) He remembered an outbreak of Pleuro-pneumonia in his own neighbourhood. A number of sheds were disinfected in the ordinary way with carbolic acid powder and the place was whitewashed. Five years afterwards the disease broke out again, because, as he believed, the whitewash tumbled off the walls. Steam was the best disinfectant.

Mr. GREAVES agreed with Mr. Olver that the whitewashing was useless; unless the germs of the disease were properly destroyed they were certain to develop themselves even after a long interval. Alluding again to the case mentioned by Mr. Barling, he admitted it was difficult in the face of such an instance to believe that Glanders was incapable of spontaneous origin. But the Cattle Plague had been spread in hundreds of cases owing to the germs of the disease having been carried by men. Birds and dogs would also carry them. Professor Simonds had said that the excreta of a diseased animal taken on the end of a lancet from a stable at one end of the land to a stable at the other would be sufficient to produce the disease. They evidently had much to learn on the subject. But he believed that the advance of science would confirm his belief that the disease could only be produced by contagion.

Mr. WRAGG spoke of the importance of the subject under discussion, and said Mr. Greaves was not a gentleman who objected to those who did not agree with him. It had not been his experience to see horses with tubercles in their lungs which were not able to undergo exertion. He had seen several horses slaughtered when suffering from Glanders, and in the majority of instances they had been worked long after tubercles had formed. The question for consideration was how long the tubercles had formed after the glanderous poison had assumed an active state. His belief was that it took some weeks. He bowed to Mr. Greaves' superior experience when he said that Glanders might be produced if a horse breathed the air in an apartment with an affected animal, and the emanations from the skin were likely to affect another animal. Whilst quite agreeing that Glanders must be produced by contagion, he was scarcely prepared to go so far as Mr. Greaves; if he were, he should not like to go near many glandered horses. The case mentioned by Mr. Barling seemed, perhaps, to rather upset the contagion theory, but it must be remembered that the contagion could be conveyed in numerous ways. He was inclined to believe that the lungs formed the seat of disease in Glanders and Farcy. As to preventive measures, the principal thing was to examine the stud as carefully and as frequently as possible. When he had a case of Glanders, he carefully examined the stud throughout once a week. In disinfecting, limewash was useless. unless mixed with carbolic acid or chloride of lime.

(*To be continued*)

PROCEEDINGS OF THE SECOND GENERAL MEETING OF THE NATIONAL VETERINARY ASSOCIATION,

HELD AT THE VICTORIA UNIVERSITY (OWEN'S COLLEGE), OXFORD STREET, MANCHESTER,

ON WEDNESDAY AND THURSDAY, JULY 30TH AND 31ST, 1884.

The President (THOMAS GREAVES, ESQ., F.R.C.V.S.) occupied the chair.

The members present were :—Messrs. J. W Anderton, Skipton-in-Craven; W. Awde, Stockton-on-Tees; J. M. Axe, Doncaster; Professor J. W. Axe, London; E. W. Baker, Liverpool; C. T. Barnes, Cheadle; J. Bell, Carlisle; H. Blunt, Lutterworth; A. W. Briggs, Halifax; T. Briggs, Bury; A. Brookes, Pilkington; W. Brookes; W. Broughton, Leeds; G. W. Carter, Keighley; J. S. Carter, Bradford; H. J. Cartwright, Wolverhampton; C. Challinor, Pendlebury; A. H. Darwell, Northwich; J. Donald, Wigton; W. A. Edgar, Dartford; C. W. Elam, Liverpool; J. C. Elphick, A.V.D.; E. W. Faulkner, Manchester; H. Ferguson, Warrington; J. H. Ferguson, Leeds; Dr. G. Fleming, P.V.S., A.V.D.; T. Fletcher, Sheffield; F. Garside, Disley; W. F. Greenhalgh, Leeds; J. Haslam, Manchester; T. H. Higgott, Bakewell; T. Hopkin, Manchester; J. Howell, Rochdale; G. Humphries, Manchester; H. Hunter, Newcastle; J. S. Hurndall, Liverpool; J. Ingram, Manchester; T. A. Killick, A.V.D.; J. Lambert, A.V.D.; A. Lawson, Manchester; J. Lawson, Manchester; H. G. Lepper, Aylesbury; W. Lewis, Crewe; W. E. Litt, Shrewsbury; S. Locke, Manchester; W. Lomas, Buxton; W. H. Longhurst, Hull; A. J. McCullum, Edinburgh; J. Mackinder, Peterboro'; James Martin, Nantwich; G. Gartside Mayor, Kirkham; Professor McCall, Glasgow; J. W. T. Moore, Birkenhead; C. Moir, Cardiff; E. Nuttall, Preston; H. Olver, Tamworth; O. Over, Rugby; J. A. Polding, Bury; W. Pritchard, London; J. H. Reynolds, Daventry; M. J. Roberts, Manchester; R. Roberts, Kendal; J. A. Rostrom, 2nd Life Guards; J. Rowe, London; B. H. Russell, Grantham; T. Runciman, Market Deeping; H. J. Simpson, Windsor; T. H. Simcocks, Drogheda; W. W. Smart, Newcastle-on-Tyne; B. Smith, Barnsley; H. Stanley, Birmingham; J. B. Taylor, Ashton-under-Lyne; P. Taylor, Manchester; W. A. Taylor, Manchester; H. Thompson, Aspatria; J. C. Toop, Knaresboro'; R. C. Tregger, Newcastle-under-Lyne; J. B. Unsworth, Market Drayton; Professor Walley, Edinburgh; P. Walker, Bradford; W. J. Welsby, Liverpool; A. Wilkinson, Ashton-under-Lyne; W. Whittle, Worsley; W. Wiggins, Market Harboro'; Professor Williams, Edinburgh; W. Woods, Sen., Wigan; W. Woods, Jun., Wigan; F. W. Wragg, *Treasurer;* J. B. Wolstenholme, Manchester, *Local Secretary;* and G. A. Banham, Cambridge, *General Secretary.*

There were also present as visitors :—Professors W. Lemont, M.B., and Tuson, F.C.S., and Messrs. W. Allison, W. Anderson, J. Barber, J. Barlow, J. W. Bennett, Jun., J. R. Blair, J. Bunnell, J. H. Carter, F. P. Carter, T. Coats, J. Colam, Secretary S.P.C.A.; L. Delacherois, J. L. Dixon, E. Dunn, G. Ellison, M. Fitzmaurice, L.R.C.S.; T. C. Fletcher, A. C. French, J. Fresham, J McGavin, Galloway; J. Hall, W. Hall, O. Harper, H. C. Harrison, T. Harrison, A. J. Haslam, J. H. Hine, F. Holmes, W. Heelen, G. Humphries, S. Jackson, J. Kennedy, E. W. Killick, J. Laithwood, E. J. Lawson, A. Lawson, A. Leather, T. J. Lumprie, W. F. Martin, F.R.C.S.; J. Martin, T. Marriott, R. Maxfield, A. M. Michaelis, C. McLaren, M.D.; J. Murdock, A. New, — Packman, J. Paton, H. D. Pritchard, H. Race, R. Rimmer, R. Roberts, W. Smith, M.D.; J. W. Stickler, H. J. Urquhart,

Waarworth, P. M. Walker, J. M. Wilson, A.V.D.; J. Wright, jun.; T. Yarwood, T. P. Young.

Apologies for non-attendance were received from the following members :— Messrs. N. Almond, T. G. Bate, E. E. Bate, F. Blakeway, W. Bower, J. Burnett, Thos. Burrell, J. Cameron, W. S. Carless, J. Cheeseman, A.V.D.; C. Cunningham, F. Cupiss, D. Dudgeon, Wm. Duguid, H. Edgar, W. F. Garside, G. Goodacre, W. Graves, T. D. Gregory, M. Harpley, J. P. Heath, M. Hedley, O. Hills, S. G. Holmans, S. E. Holmans, E. A. Hollingham, J. C. James, H. Kidd, G. A. Lepper, T. H. Lewis, W. Longhurst, Fred. Low, E. Mellett, E. J. Mellett, G. B. Miller, E. Nettleship, F.R.C.S.; T. Olver, G. G. Oliver, J. D. Overed, J. Penberthy, J. Preston, W. Reekie, W. Roach, Professor W. Robertson, R. Rutherford, F. G. Samson, A. H. Santy, R. A. Stock, Page Wallis, G. Waters, W. Wilson; and also from W. Agnew, Esq., M.P.; Professor A. Gamgee, M.D., Professor A. W. Ward, and Professor W. C. Williamson, Owen's College; F. Headlam, Esq., and J. Makinson, Esq., Stipendiary Magistrates; and Professor Simonds.

FIRST DAY'S SITTING.

The PRESIDENT opened the second General Meeting of the Association by heartily welcoming its members and visitors to Manchester. Some business matters were then considered, a detailed account of which will be found presently.

The following Report was then received and adopted by the meeting. It had already been forwarded to every member of the Association; therefore it was taken as read.

REPORT OF NATIONAL VETERINARY ASSOCIATION FOR 1884, IN ACCORDANCE WITH RULE XLII.

Officers.

It will be remembered that the Officers of the Association were nominally elected at the General Meeting, held in London, on May 8th, 1883, as follows :—

President : Thomas Greaves, Esq., F.R.C.V.S.

Vice-Presidents : Messrs. Charles Hunting, South Hetton; J. Lawson, Manchester; H. Olver, Tamworth; T. H. Simcocks, Drogheda; W. A. Taylor, Manchester; Wm. Woods, Wigan.

The Council consists of the Presidents and Secretaries of the existing local Veterinary Medical Societies, the Principals of the Veterinary Schools, the Principal Veterinary Surgeon of the Army Veterinary Department, and six members of the profession.

The election of these latter gentlemen was delegated to the President and Vice-Presidents, who selected the following gentlemen by ballot :— Messrs. Thomas Briggs, Bury; Tedbar Hopkin, Manchester; Walter Lewis, Crewe; W. E. Litt, Shrewsbury; Peter Taylor, Manchester; and Wm. Whittle, Worsley.

The Treasurer, Mr. F. W. Wragg, London, and the *General Secretary*, Mr. G. A. Banham, Cambridge, were re-elected.

The Provisional Committee was also left to the Presidents and Vice-Presidents to elect. Each was, therefore, asked to propose gentlemen, and the requisite number, selected by ballot, are as follows :—

Provisional Committee.

Mr. A. Bain.
„ T. Briggs.
„ C. E. Challinor.
„ W. Dacre.
„ C. W. Elam.
„ E. Faulkner.
„ H. Ferguson.
„ T. Hopkin.
„ Jas. Howell.
„ J. S. Hurndall.
„ J. W. Ingram.
„ J. Lambert, A.V.D.
„ Alex. Lawson.
„ John Lawson.
Mr. Wm. Leather.
„ S. Locke.
„ J. W. T. Moore.
„ H. Olver.
„ Peter Taylor.
„ Wm. A. Taylor.
„ Wm. Whittle.
„ J. B. Wolstenholme.
„ Wm. Woods.
„ Wm. Woods, jun.
Dr. G. Fleming.
Mr. Thos. Greaves
„ F. W. Wragg
„ G. A. Banham
} *Ex-Officio.*

The President of the Association was selected Chairman, and Mr. J. B. Wolstenholme Local Secretary to the Committee.

The Provisional Committee held their first meeting in September, 1883, when the President announced that he had been in communication with Professor A. Gamgee, of the Victoria University, with the object of obtaining suitable premises for the meeting. He was pleased to say that the Professor had warmly interested himself on our behalf, and the authorities had very kindly placed the rooms of the University at our disposal towards the end of July. This offer was gladly accepted by the Committee.

It was decided that the meeting should last over two days. Four subjects were chosen for discussion, and the names of the essayists proposed for the Local Secretary to obtain their consent. At a subsequent meeting, gentlemen were appointed to open the discussions.

Professor Gamgee also kindly promised to give an interesting description of various modern instruments and appliances used in original research, which offer the Provisional Committee gladly accepted.

It was also resolved that space should be set apart for the display of New Inventions, Instruments, and Drugs used in Veterinary practice.

A letter has been received from one of our members asking whether he could send his views in writing upon the subject under discussion, if he were unable to attend the general meeting. An answer was sent to the effect that at present our rules would not admit of such a proceeding.

The date at which the General Meeting should be held was next considered, and July 22nd and 23rd fixed as the days, provided they did not clash with anything else which would be likely to prevent the members attending. With this view the General Secretary was instructed to write to the Secretaries of the R.C.V.S. and the principals of the Schools, to ascertain the date of the examinations, and to the President and Secretary of each Local Veterinary Medical Society, to find out the date of their meetings. It was, however, found that it would be more advisable to postpone our meeting to July 30th and 31st.

With a view to increasing the number of members, the Provisional Committee issued the following circular letter to every member of the veterinary profession who was not a member of the Association :—

Dear Sir,—The Provisional Committee of the above Association desire to call your attention to the fact that the next General Meeting will be held in the Victoria University (Owen's College), Manchester, on the 30th and 31st of July next, at 10.30 and 2.30 each day, where subjects of great practical importance to veterinary science will be brought before the meeting for

discussion. They are anxious the gathering should be as representative of the profession as possible; therefore, they would be glad if you will become a member, and give them the pleasure of your presence at the General Meeting. The Annual Subscription to the Association is 10s. 6d., and may be forwarded to either of the Secretaries.

The papers on the four subjects will be printed and circulated to the members of the Association at least a fortnight before the meeting, so that—at the meeting—the discussion may be opened at once, in the following order :—

FIRST DAY.

Subject I.—"Public Health as Affected by the Food Supply obtained from Animals." Written by Professor McCall. Discussion opened by Professor Walley, at 10.30 a.m.

Subject II.—"Epizoötic Aphtha" (Foot-and-mouth Disease). Written by Professor Williams. Discussion opened by Mr. T. H. Simcocks (Drogheda), at 2.30 p.m.

SECOND DAY.

Subject III.—"Influenza in the Horse." Written by Professor William Pritchard. Discussion opened by Mr. W. A. Edgar (Dartford), at 10.30 a.m.

Subject IV.—"Cruelty to Animals." Written by Mr. Thomas Briggs (Bury). Discussion opened by Professor Pritchard, at 2.30 p.m.

Professor Gamgee has also kindly promised to give an interesting description of various modern instruments and appliances used in original research.

Members and Visitors will be able to obtain Luncheon from 1 to 2 o'clock each day, on the premises.

Space will also be set apart for Exhibiting Instruments, Samples of Drugs, and New Inventions used in Veterinary Practice.

The Veterinary Surgeons residing in Lancashire will provide a Dinner at the Grand Hotel for all *Members* of the Association on the 1st day of meeting, at 6 p.m. Non-members wishing to join at this social repast may do so. Dinner tickets, 10s. 6d. each (wine optional).

Members of the profession, *not being Members of the Association*, can attend the meeting (as visitors) and join in the discussions, if they will send their names to either of the Secretaries, who will remit them a ticket of admission to the meeting.

An early reply is requested to facilitate the arrangements.—We are, sir, yours truly,

J. B. WOLSTENHOLME, 102, *Quay Street, Manchester.*
GEO. A. BANHAM, *Downing Street, Cambridge.*

The meeting has, in addition, been freely advertised in our journals, and noticed by the editors, also for four weeks advertised in the Manchester papers.

The Lancashire Veterinary Surgeons have kindly invited the members of the Association to dine with them during their visit to Manchester, and it is hoped that this generous courtesy will be fully appreciated by our members accepting their invitation. As many of our members may be accompanied by friends as visitors to the meeting, it was thought desirable to open this repast to them by paying 10s. 6d. each, thus obviating the necessity of their separating during the evening, which otherwise would have been the case had the visitors been excluded, and the members accepted the invitation.

New Local Societies.

We are glad to report that three new local societies have been started during the past year—viz., the Border Counties, the Royal Counties, and the Western Counties. The General Secretary took upon himself to communicate with each President and Secretary of these societies, asking them to bring our Association before their members, and, if possible, induce them to join and assist us. He is pleased to report that all answered favourably to the call.

Number of Members.

We are glad to report that the Association is steadily increasing its number of members. Last year the Association commenced with 175 members, five of whom have this year withdrawn their names, and three have been taken away by death. We have, however, 54 new members this year, so that our total number of members is now 221.

This is by no means what we think it should be in a profession of over 2,600 members, and the Council entreats each individual member to do his utmost to increase our number, and assist in any other way he can in promoting the objects of the Association.

Treasurer.

Financially, the Society is prospering, as will be seen from the balance sheet. In commencing such Associations, the expenses usually exceed the receipts, but we have been able to curtail the expenses, so that we have a very fair balance in hand to start with, without hindrance to the welfare of the Association.

President's Address.

GENTLEMEN,—The duty of delivering an inaugural address now devolves upon me. In the first place, permit me to thank you, and to say how deeply sensible I am of the great honour you have conferred upon me in electing me your President; and further, to express my very great gratification in seeing myself supported by so numerous and distinguished an assemblage of veterinary surgeons from all parts of the three kingdoms.

The National Veterinary Association is, in itself, an evidence of the progress our profession is making. It is the outcome of the various veterinary medical associations which have sprung up in various places of late years. This Association follows the same lines as the British Medical Association. It is a centre of power, and is intended to give an impetus in our profession that never existed before; a spirit is stirred within us, and we are resolved to aspire to a higher sphere of usefulness. The obtaining of our Act of Parliament recently, the obtaining of our Charter and our three supplementary charters, together with the suppression of ignorance and empiricism in our profession, are, each of them, great steps in the line of progress. Two things must be recorded to the honour of Manchester; the first is, that it stood in the very first rank of the cities that gave birth to these Veterinary Medical Associations, and now it is holding within its boundary this, the Second General Meeting of this Association.

Our great object is to study the nature of the diseases that affect our domestic animals; to obtain for our noble profession its proper place. This is our province, and our duty to try to awaken and concentrate the minds of our profession on great subjects, and to get a clearer and fuller knowledge of these diseases, and also the laws and conditions of their propagation. Oh, how often have I anxiously wished that the intellect of my profession could but evolve the grandest thoughts ever conceived on these subjects; that we could so strengthen and give force to our intuitive knowledge, as to put

Dr. NATIONAL VETERINARY ASSOCIATION—Balance Sheet for the Year 1883-4. Cr.

1883.						£	s.	d.
May 10.—To	9	Annual Subscriptions,	per	Mr.	Elphick	4	14	6
Sept. 8. ,,	5	,,	,,	Mr.	Trigger	2	12	6
Oct. 1. ,,	48	,,	,,	Mr.	Penberthy . .	25	4	0
,, ,, ,,	48	,,	,,	Mr.	Banham	25	4	0
,, ,, ,,	1	Life	,,	,,	,,	5	5	0
,, ,, ,,	1	,,	,,	Mr.	Wragg.	5	5	0
,, 23. ,,	9	Annual Subscriptions	,,	Mr.	Wolstenholme	4	14	6
1884.								
Feb. 16. ,,	6	,,	,,	,,	Mr. Moon . .	3	3	0
May 1. ,,	6	,,	,,	,,	Mr. Banham	3	3	0
						£79	5	6
To Balance brought down						£37	11	11

	£	s.	d.
By Disbursements—Mr. Penberthy :—			
Postage	3	17	0
Stationery	0	6	7
Expenses of Room, Red Lion Square	0	7	6
,, ,, Bacon's Hotel	0	14	0
,, ,, Society of Arts	2	7	0
Warren Hall & Co.'s Account	4	8	9
Hazell, Watson, & Viney's Account	14	14	3
,, Disbursements—Mr. Banham :—			
Spalding's Account	0	11	6
Hazell, Watson, & Viney's Account	4	9	6
Stamps and Wrappers	5	4	0
Carriage of Parcels	0	8	0
Minus of Half Guineas	0	1	6
Scribbling Paper	0	2	6
Telegram and Carriage of Parcel	0	1	6
Twine	0	0	6
Travelling Expenses	1	0	0
,, Disbursements of Treasurer :—			
Wicke's Reporter	2	12	6
Journal	0	7	0
,, Balance	37	11	11
	£79	5	6

Audited and found correct,

July 10th, 1884.

EDW. S. SHAVE, Professor Roy. Vet. Coll.
T. G. CHESTERMAN, Leman Street, Whitechapel.

ourselves in possession of a power which would enable us to establish a means whereby those great scourges which occasionally decimate our flocks and our herds, shall become a thing of the past.

Had our knowledge been properly appreciated, and our advice been followed in the year 1865, at the very commencement of the Rinderpest scourge, millions of pounds would have been saved to the country. Our advice was not taken, although it was urged in words not deficient in force; other counsels prevailed. Medical practitioners and other amateurs were allowed to offer opinions and to give advice, all of which soon proved to be utterly futile; these false views, false knowledge, and false advice, completely ignored and overshadowed the sound opinion expressed by the veterinary profession, viz., *to stamp it out, as the only safe course to adopt;* but, in the meantime, this scourge spread like unto a raging fire throughout the length and breadth of the land. Had we then been as influential a body as we are now aspiring to become, our counsels would have been listened to by those in high authority, and the lives of tens of thousands of cattle would have been saved.

Science has already done much, and is every year doing more to minimise some form of danger by which we are surrounded. It is the peculiar and legitimate province, as well as the duty of the veterinary surgeon to follow, with scrupulous care, the teaching of science, and to observe how wisely it is leading us, and directing our attention to the means of *preventing disease* in our domestic animals by studying the laws of sanitation, the exclusion of septic germs, and by adopting the antiseptic treatment. The increased, and increasing knowledge derived from experience, the collective investigation of the nature of disease, together with the resources of the veterinary surgeon of the present day, is far in advance of the knowledge brought to bear upon disease by the medical science which was within the reach of our forefathers. We work by a light developed by experience, by science, by reason; we put in practice more gentle and more humane methods than they did, and with far greater success.

It appears to us that there never was a time when there was so great a necessity as now for veterinary surgeons to be "up and doing," to throw all their strength into their avocation, and to carry our knowledge to a point of perfection unknown before, to collect and circulate the results of intelligent close observation on the diseases of our domestic animals, to create in our profession more intellectual life, more vigour, more activity.

(*To be continued.*)

Obituary.

We have to report the death of James Cowie, M.R.C.V.S., of Dulwich Common, who graduated so long ago as 1831. We believe Mr. Cowie never practised his profession, but pursued agriculture, with more or less success, in Scotland and England. Though not a practitioner, he nevertheless held the office in the Royal College of Veterinary Surgeons of Vice-President, Councilman, and examiner in the Scottish section of the Examining Board.

The death is also reported of M. J. Roberts, M.R.C.V.S., of Manchester, a graduate of 1870.

Mr. Carless died at his residence, Bridge Street, Worcester, on Monday, October 6th, 1884, between the hours of eleven and twelve, after a brief illness of five days.

Army Veterinary Department.

Gazette, October 24th.

The following Veterinary Surgeons to be Veterinary Surgeons First-class:—John P. Adams, Walter B. Spooner, Samuel Gellespie.

First-class Veterinary Surgeon Durrant has embarked for a tour of service in India.

Notes and News.

CATTLE PLAGUE IN HUNGARY.—The official return for the week ended October 4th shows eight animals remaining affected at the close of the week, on one farm in Kent, as against sixteen animals affected in the same farm at the close of the previous week. The cattle market at Pressburg, in Hungary, has been suspended for ten days, and large numbers of cattle have been placed under military surveillance, because an ox from Transylvania, on being killed, was found to have Cattle Plague. Cattle Plague has also broken out in the Russian province of Bessarabia. The Roumanian Government has surrounded the frontier by a military cordon. Transylvania and the County of Pressburg were on Saturday proclaimed in the Vienna *Official Gazette* to be infected with Cattle Plague, and consignments of animals from those places are forbidden to enter the Vienna market. The *Toronto Globe* states that: "Notwithstanding statements of Dr. M'Eachran that Pleuro-pneumonia prevails in the Western States, and, despite the proclamation in force against such proceedings, it seems that Montana cattle are being driven across the plains to Swift Current, and shipped eastward to St. Paul. This illegal traffic is winked at by the Department of Agriculture, though the danger of introducing the disease in Canada is very great; but, so long as Mr. J. H. Pope remains at the head of the Agriculture Department, no better can be expected."

NEUROTOMY.—In a very interesting paper, read by Veterinary Surgeon Very, before the United States Veterinary Medical Association at the meeting held recently in Cincinnati, on the operation of neurotomy on trotting-horses, we find the following observations:—"The operation of neurotomy has had many advocates and many opponents. Under some circumstances, particularly where relief from painful lameness is otherwise not to be obtained, it may be considered a humane and practical method of treatment. Other circumstances render it objectionable, even in incurable lamenesses. The conscientious practitioner will hesitate, and investigate closely, before deciding to operate in any case. Haphazard undertakings of this kind will lead to queer results, and to some very unwelcome and entirely unanticipated. There are some few operations of a harmless nature, like filing the molar teeth, which one might feel justified to undertake at the solicitation of an owner. I maintain, on the other hand, that it is unprofessional and vicious, as well as 'un-American,' to cut off the tail of a horse to conform to a foolish fashion, even at the request of a wealthy and influential patron. The operation of neurotomy certainly ought never to be performed except the judgment and conscience of the operator justifies it, and no respectable man would practise it for dealers in horses simply to make the animals more merchantable."

A YANKEE VERMIFUGE.—Report says that a dose of vermifuge was lately administered to a California trotting horse known as James H., which was supposed to be suffering from worms. The medicine brought away a snake sixteen inches in length and as thick as the butt of a riding whip. The horse has heretofore been vicious and ungovernable, having killed one man and seriously injured another. Since the departure of the snake James H. appears like a different animal.

HAY AS FOOD FOR LIVE STOCK.—Some experiments have been made as to the comparative value of good hay for stock. As to the result, it is estimated that 100 lb. of hay are equal to 275 lb. of green Indian corn ; 400 lb. of green clover ; 442 lb. of rye straw ; 360 lb. of wheat straw ; 164 lb. of oat straw ; 180 lb. of barley straw ; 153 lb. of pea straw ; 200 lb. of buckwheat straw ; 400 lb. of dried corn stalks ; 175 lb. of raw potatoes ; 504 lb. of turnips ; 300 lb. of carrots; 54 lb. of rye ; 46 lb. of wheat ; 59 lb. of oats ; 45 lb. of mixed peas and beans; 64 lb. of buckwheat ; 57 lb. of Indian corn ; 68 lb. of acorns ; 105 lb. of wheat bran ; 167 lb. of wheat, pea, and oat chaff ; 179 lb. of mixed rye and barley; 59 lb. of linseed ; and 339 lb. of mangel wurzel.

TUBERCULOSIS IN RABBITS.—It has been known for a considerable time that, in certain localities in New Zealand, Tuberculosis prevailed among rabbits, and to such an extent as to temporarily clear considerable areas of them. Precisely similar circumstances having been observed in some districts in Tasmania, the idea was suggested that an easy means had been discovered of extirpating the pests. Investigation there, conducted at the instigation of the officials charged with the administration of the Rabbit Act, established the identity of the disease with Tuberculosis, and the policy of turning at large extensively diseased rabbits, or rabbits inoculated with the virus from those already affected, was discussed in the columns of the *Witness*. In the beginning of this year, under instructions from the Government of New South Wales, Mr. Willows, a competent veterinary surgeon, proceeded to Tasmania, and on several infested areas there investigated the subject exhaustively. The conclusions he arrived at have lately been published, together with the details of his procedure, and these are in effect as follows :—100 rabbits were selected from an infected area ; of these 46 were half to full-grown, the remaining 54 from three weeks old to half-grown. All were killed in the presence of Mr. Willows, who made the *post-mortem* examinations. Of the 46, 11 were not in any way infected, 28 were in the first stage of the disease, and 7 in the second and third stages. Of the 54 young rabbits, in 13 there was no appearance of disease ; 11 were in the first, and 30 in the second and third stages. Unless when in the most advanced stage, when the bodies were much wasted, there were no external appearances to evidence disease. When the disease had made much progress, the lungs were greatly wasted, pale, and flaccid. In the first stage, on opening the abdominal cavity indications of the disease were apparent in numerous tubercular depositions. When in the second stages, the liver had numerous enlargements of a greyish-yellow tint, and the mesenteric glands were affected. After a most careful examination of every case, Mr. Willows declares that the *post mortem* appearances "indubitably confirmed the existence of Tuberculosis." Mr. Willows further arrived at the conclusion that the disease is hereditary and transmissible. It is slowly but surely clearing whole districts in Tasmania of rabbits, and if not allowed to die out, will eventually exterminate them all over the island. He also assumes to have established a connection with the appearance of Tuberculosis in rabbits and the cattle disease, that bovine Scrofula caused the rabbit disease.

THE INFUSION OF A SALT SOLUTION AFTER LOSS OF BLOOD.—At a recent meeting of the Physiological Society of Berlin, Prof. Kronecker spoke of a

series of precautionary measures to be observed in cases of saving life by an infusion of common salt solution. He first described how animals after severe loss of blood recovered in the best and most rapid manner by introducing into their blood channels a like quantity of physiological common salt solution. In the case of infusions of albuminous solutions, of serum sanguinis, and even of the blood of another individual of the same species deprived of its fibrin, there was, according to direct measurements, an invariable destruction of blood corpuscles. With infusions of common salt solution, on the other hand, blood corpuscles were seen to increase somewhat rapidly. Prof. Kronecker then proceeded more particularly to lay down precautionary rules to be observed in applying this agency to man. In the first place, the composition of the solution must be such as was most compatible with the human organism. It would appear that a solution of 0·73 per cent. exercised the least irritation on the human body, and was therefore the most appropriate for infusions designed to save life. The addition of carbonate of alkali, recommended by some, had an injurious effect. Of great importance were the velocity and pressure with which the infusion was injected; both ought to correspond with the velocity and pressure in the vein into which the solution entered. The common salt solution should, further, be disinfected beforehand by boiling, and the air which penetrated into the reservoir while it was being emptied must be filtered off by means of a wadding stopper. The injurious effect of too strong pressure was illustrated by a comparative experiment on two rabbits.

Texas Fever in American Cattle.—*The Breeders' Gazette* (Chicago) makes the following remarks on the outbreaks of Texas Fever in Chicago :—One of the most alarming and fatal outbreaks of Texas Fever that we have had for years is now confronting the cattle-dealers all along the line from Topeka to Chicago. One hundred and twenty deaths, out of a lot of 375 head, shipped from Indian Territory, through Kansas City, was the record at the Chicago Stock Yards last Monday, as reported by the daily papers of this city. More of the same sort came on Tuesday, and more deaths were reported. News of a similar import of deaths in the cars, and of cattle switched off and quarantined at Topeka, Kansas City, and elsewhere along the railroads toward Chicago, comes by telegraph. The Commission men at the Chicago Stock Yards who succeeded in having the Animal Industry Act, which passed Congress last spring, declare that the Texas Fever was not a contagious or infectious disease within the meaning of the Act, are now seeing the fruits of their labour in the absence of any law whatever, State or National, by which a quarantine can be enforced against this fatal cattle scourge in the State of Illinois ; and the railroad companies can dump their infected and dying cattle into our stock yards, and reload with others without even so much as an attempt at disinfecting a single car. Storrs, Allerton, Morris and Co. have done their work well, and the cattlemen at our stock yards and to the southwest of us are reaping the fruits of the labour of these men at Washington last year. We have the old stereotyped cry that it is not Texas Fever, and not contagious and infectious—"nothing but the effects of drinking too much alkali water," or "eating ticks from Texas cattle," or "bloody Murrain," etc. And we shall probably soon hear the old stereotyped lie that "there are no contagious or infectious diseases among the cattle of this country" ; that "our cattle are the healthiest in the world," etc. But that it *is* the Texas Fever, and that it *is* infectious and deadly, all old stockmen and all experienced veterinarians know only too well. The Live Stock Exchange and the Stock Yards Company are doing all they can do in the absence of any law upon the subject to enforce a quarantine against the infected cattle and to prevent further damage ; but the seeds of infection have already been extensively sown, which

will continue to do their deadly work until the frosts of next November or December shall have destroyed their vitality.

SWINE PLAGUE IN THE UNITED STATES.—A good deal of uneasiness has lately prevailed with regard to the sanitary condition of Washington, more particularly with respect to its supply of water. The Potomac is the primary source naturally, and some years ago an aqueduct was constructed, at a cost of many million dollars, to bring the water from the great falls of that river, about eighteen miles distant, to the western boundary of Georgetown, where the navigation ends, with suitable reservoirs at different intervals. The remoter sections of the city, however, have long been complaining of an insufficient supply, and it has therefore been determined to spend another two million dollars in making a tunnel, which shall convey the water from the reservoir underneath Rock Creek to the elevation in the neighbourhood of the Howard University. This would have been all very well as far as it went, had not a new danger threatened the water supply where it was least expected. Above the Potomac, where the aqueduct receives its water, the country is agricultural and very sparsely settled, possessing no manufactures of any kind, and it was thought that no pollution could by any possibility arise in such a district. For some weeks past, however, hog cholera has prevailed very extensively in those counties of Maryland and Virginia bordering the Potomac between the great falls and Harper's Ferry. Instead of burying the carcases of the poisoned hogs, the farmers have chosen the most simple way of flinging them into the river ; and the health officer of the City of Washington states that in one stretch of water, close to where the city supply is taken, at least a thousand cholera hogs are floating about in the river. The worst of it is that no law exists to prevent the continuance of such a dangerous nuisance, and even should the Maryland farmers be persuaded to bury their dead hogs, it will be a long time before the pollution of a thousand carcases disappears from a tidal river.

DISEASE AMONG DOGS IN MADRAS.—A fatal disease has broken out amongst the fox-hounds of the Ooty hunt. Twenty-three dogs have died up to date, and the loss is estimated at nearly Rs. 4,000. This, of course, has put an end to sport for the season. Mr. Mills, Inspector of C. Division, was called in, while at Ooty, to investigate the matter, and he is of opinion that the outbreak is due to a virulent form of Enteric Fever.

Correspondence.

HOW ARE COUNTRY VETERINARY SURGEONS TO GET A LIVING?

SIR,—The remarks of a "Country Vet." in your last issue are much to the point, but hardly long enough. What with quack medicine vendors, registered practitioners, and, lastly, Professor Brown's scheme, the above question may well be asked. This scheme consists, as we well know, of the publishing of a pamphlet on the "Domestic Treatment of the Animals of the Farm," in which farmers who are members of the Royal Agricultural Society are enabled to read the symptoms and treatment, and obtain the medicines from a district veterinary surgeon, appointed by the R.A.S., or from an ordinary chemist, or what is more likely, in the form of the "Farmer's Medicine Chest" *à la* Professor Brown, as now advertised by many medicine-vending firms in the agricultural journals. In the two latter instances the ap-

pointed local veterinary surgeon even will not get much profit from his appointment. But the neighbours of the man appointed will get on even worse than he. As in the pamphlet symptoms are discussed as well as treatment, no doubt the farmer will in many cases himself diagnose, and unless he gets in a fog, will not call a veterinary surgeon, who, when he does call, will be expected to prescrise medicines from the pharmacopœia of Professor Brown's pamphlet, which medicines the farmer, no doubt, will have in stock; thus the veterinary surgeon loses any profit that can be got from medicines, which, in many cases, is all that can be got at all. One would think that Professor Brown would be the last person in the world to stoop to gain popularity in the agricultural world by such a miserable, mean plan. He holds two very high positions in the veterinary world, viz., those of chief veterinary surgeon to the Privy Council, and professor of the diseases of the domesticated animals other than the horse at the London veterinary school. In the first office, we had proof about a year ago of the watchfulness he exercises over the interests of members of our profession when the Privy Council issued an order empowering the election of registered practitioners as veterinary inspectors, a post before open only to M.R.C.V.S. When the Council were going to question him about it at a meeting he did not turn up. In the second office he holds, young veterinary surgeons have still more cause to complain, and if pupils at Camden Town relied only on the efforts of Professor Brown to enable them to pass the examination of the R.C.V.S., I am afraid they would have a miserable failure. His labours are confined to giving two lectures a week throughout the academical year, and he takes no part in the practical demonstrations given by the other members of the staff of the College. These demonstrations, and especially those given by Professor Robertson, take the form of what are known to students as "grinds." As to their superiority over Professor Brown's lectures, no student would hesitate a moment in saying that one of Professor Robertson's "grinds" was worth several of Professor Brown's lectures.

Following is the list of lectures as taken from the syllabus of the Royal Veterinary College.

[*Copy.*]

"PATHOLOGY IN RELATION TO THE ANIMALS OF THE FARM, EXCEPTING THE HORSE.

"*Winter Session*, 1883-4.

"PROFESSOR G. T. BROWN.

"The Lectures commence in October, and extend throughout the Winter and Summer Sessions.

"Importance of Veterinary Medicine and Surgery in its Application to the Diseases of Live Stock of the Farm—Number of Live Stock in this Country—Losses from Disease—Animal Plagues—Sanitary Police Measures—International Laws relating to Cattle Traffic—Necessity for more Constant and Systematic Interchange of Views between Continental and English Veterinarians—Differences in the Positions of the Animals of the Farm in Regard to Occupation, Exposure to Climatic Changes, and Diet.

"Investigation of Outbreaks of Diseases, an Important Duty of the Veterinary Surgeon.

"*Methods of Inquiry.*—Critical Examination of the Circumstances under which an Outbreak of Disease Occurs—Atmospheric Conditions—Soil—Nature of Herbage—Water-supply.

"*Classification of Diseases.*—No Complete System of Classification of

Diseases Available—A Convenient Arrangement is the one which includes in one Class all true Contagia, and in another all Diseases of Organs, as those of the Locomotory, Respiratory, Circulatory, Digestive, Integumental, Nervous, Urinary, and Generative Systems.

"*Contagious Diseases.*—Contagium—Infective as Distinct from Infectious—Normal and Infective Inflammations—Septic Poisoning—Germs not always Detectable by the Microscope—Test by Cultivation in a Sterilized Fluid, or by Tyndall's Method of Illumination.

"*Anthrax.*—History of the *Bacillus Anthracis*—Cultivation under Different Conditions—Pasteur's Investigations—Dr. Klein's Inquiries—Danger of Introducing Anthrax into this Country by Experimental Inoculation.

"*Symptomatic Anthrax.*—Bacteria in Tissues and not in Blood (Bouley), Texan Fever in Relation to Anthrax—Peculiar Form of Infection in Texan Fever—Localization of the Disease—Appearance in Certain Latitudes.

"*Cattle Plague.*—Early History of Animal Plagues in Europe in Third, Sixth, and Ninth Centuries—Cattle Plague on the Continent—Extension to England in 1224—Other Outbreaks in England in 1348, 1714, 1745, 1865—History of the Revel Cargo in 1865—Extensive Spreading of Disease in England—Royal Commission on Cattle Plague in 1865—Outbreak in Ireland, 1866—Subsequent Outbreaks of Cattle Plague in England in 1872 and 1877—Application of the "Stamping-out" System and Extirpation of the Disease.

"*Pleuro-pneumonia.*—Prevalence of the Disease on the Continent before its Appearance in this Kingdom—Introduction into Ireland in 1840—Appearance in London in 1842—History of the Progress of the Disease—Legislation in 1869 and 1878.

"*Tuberculosis* (*Bovine*).—References to the Various Phases in the History of Tubercle—Scrofulous Diathesis—Structure and Metamorphosis of Tubercle—Bovine Tuberculosis in Connection with Consumption of Man—Symptoms and *Post-mortem* Appearances of Tubercle.

"*Foot-and-mouth Disease.*—Introduction into England in 1839—History of the Disease—Periodical Accession and Decline—Legislation—Contagious Foot-rot Compared with Foot-and-mouth Disease.

"*Sheep-pox.*—History—Existence of the Disease on the Continent—Introduction into England in 1847, 1865, 1866—Symptoms and *Post-mortem* Appearances—Legislation.

"*Sheep Scab.*—Mode of Detecting the Acarus—Forms of Treatment—Legislation.

"*Swine Fever.*—History—Extensive Spreading of the Disease in 1862 to 1864—Pathology—Symptoms and *Post-mortem* Appearances—Legislation.

"*Distemper in Dogs.*—Various Stages of the Disease—Symptoms—Complications—Treatment—Vaccination as a Preventative of Distemper.

"*Rabies.*—History—Geographical Distribution—Causes—Symptoms in the Horse, Ox, Sheep, and Pig—Pasteur's Observations on the Localisation of the Virus in the Nerve Centres—Legislation—Prevention.

"*Non-contagious Diseases.*—This part of the course will include a description of the diseases affecting the various organs of the body in the ox, sheep, and pig, chiefly in reference to the forms of disease which affect those animals specially. Parasitic diseases are not treated under this section, as they form part of a different course.

"*Organs of Locomotion.*—Suppurative Arthritis (Special Form in Lambs)—'Foot Foul' (Ox)—Onychia (Foot-rot—Sheep).

"*Digestive System.*—Dentition as Indicating Age—Diseases of the Teeth—Aphtha Maligna — Glossitis — Gloss — Anthrax — Actinomycosis — Choking—Dilatation of the Œsophagus, Associated with Morbid Growths from the Lining Membrane—Stricture—Tympanitis—Plenaloia—Impacted Oma-

sum—Omasitis—Gastritis—Red Water in Cattle—Hepatitis—Jaundice—Sheep-rot in Reference to its Effects on Sheep-farming.

"*Respiratory System.* — Catarrh—Laryngitis—Bronchitis—Congestion—Pneumonia—Pleuritis—Pulmonary Emphysema.

"*Circulatory System.*—Pericarditis—Fatty Heart—Foreign Substance in Heart—Hypertrophy.

"*Nervous System—Organs of Vision.* — Ophthalmia — Glaucoma — Amaurosis—Cataract—Staphyloma.

"*Integumental System.*—Eczema—Ecthyma in Sheep—Erythema—Otorrhœa (Canker in the Ear).

"*Urinary System.*—Hæmaturia—Strangury from Obstructed Urethra (Sheep)—Calculi.

"*Generative System.*—Principles of Breeding—Utero-Gestation—Abortion—Premature Labour—Natural Labour—Surgery of Parturition—Complications Affecting Mother or Offspring—Preternatural Presentations—*Lusus Naturæ*—Uterine Hæmorrhage—Spasms (after Pains)—Hysteritis—Uterine Dropsy—Prolapsus Uteri—Retention of Fœtal Membranes—Parturient Apoplexy—Mammitis—Mammary Hæmorrhage—Stricture of Milk-ducts."

This, no doubt, seems rather lengthy, but many diseases are absent from it, and more are forgotten by Professor Brown when he is lecturing. Small matters are often left out, and the student is very often asked these small matters when he is examined. This is more particularly the case in the course on non-contagious diseases. In the course on contagious diseases, Professor Brown pays far too much attention to the early history of diseases and legislative matter. These are no doubt useful, but should not symptoms and *post-mortem* appearances be paid more attention to in lecturing to young men? They can read how Cattle Plague was brought by the Revel Cargo, and, I dare say, they would not benefit by the knowledge of facts as they occurred at Mrs. Nicholls' dairy. These and many other little anecdotes help to relieve the monotony of the time during which Professor Brown lectures.

From these facts I think I have proved that Professor Brown, after being paid to teach students, does so in a very imperfect manner, and then only to deprive them by means of this pamphlet (which, I hope, is not "the forthcoming work on 'Veterinary Therapeutics,' by Professor George Brown," mentioned by Professor Tuson in the preface to the first edition of his "Pharmacopœia," issued in 1869) of their just profits. If Professor Brown does not want to lose the very small amount of confidence placed in him by the profession (as evidenced by the very bare manner in which he was elected a Councilman last May), he would do well to stop this petty method of gaining the goodwill of farmers. Trusting you will excuse the space I have taken, but with good views, I am, sir, your obedient servant,

"A LATE LONDON STUDENT."

CONTAGIOUS LUNG PLAGUE IN ILLINOIS.

SIR,—Long before this reaches you the telegraphic reports of the outbreak of what is supposed to be Pleuro-pneumonia in several herds of Jersey cattle, in the State of Illinois, will have been received. This is the first appearance of the dread malady west of the Alleghany Mountains, and the history of the communication of the contagion, so far as it is now known, develops some remarkable peculiarities. It is supposed to have been taken to Illinois either from the City of Washington, where it has existed for several years, or from a herd of imported Jersey cattle in the western part of this State. The owner of this latter herd admits the death of several animals during the latter part of winter, but insists that the disease could not have been Pleuro-pneumonia,

because his cattle, being imported, had passed through quarantine. The occupier of an adjoining farm (only a highway intervening) has a herd of three or four hundred imported Holsteins, in which it is said there have been no indications of Pleuro. If this is true, and if the disease in the Jersey herd was the real contagious Lung Plague, the case furnishes very strong evidence in confirmation of the conclusions of the Veterinary Department of the Privy Council—to wit, that this disease can only be transmitted by cohabitation of sick with healthy animals. And the circumstances attending the outbreaks at different points in Illinois justify the same inference.

Mr. Epler, of Cass County, Illinois, held a sale of Jersey cattle on Feb. 21st last. Some of the animals in this sale had been bought for the States east, by way of Indianapolis, but there is no intelligence of the infection being communicated from the cars conveying these cattle, or the premises in which they were kept; while in all the diseased herds, animals have been found that were purchased at the Epler sale, or had been in contact with them.

I do not understand why it is, in view of the care with which the experiments of the Veterinary Department of the Privy Council were made, and the high professional standing of the gentlemen conducting them, the results of those experiments are not accepted as conclusive. But instead of this, we have Mr. Paaren, official veterinarian of Illinois, issuing orders to quarantine all premises upon which diseased animals have been kept, and to prevent "all visitors to such premises from having access to the stables and to the cattle, whether these are diseased or apparently healthy." And this is assumed to be necessary to prevent the dissemination of the contagion. Is not the evidence overwhelming that Pleuro-pneumonia is not of the infectious character here assumed?

In view of these outbreaks, and the alarm occasioned by the appearance of the Foot-and-Mouth disease near quarantine stations in the State of Maine last year—for this disease, it is admitted, does infect premises, litter, &c., and may, therefore, be communicated without cohabitation—is it strange that our people are clamouring to put a stop to the importation of cattle from Europe? You do not allow us to send cattle to Great Britain, unless we slaughter them at the landing, and we are not permitted to send them to your American provinces, while our markets are open to these provinces, without restriction.

The chief of the National Bureau of Animal Industry is now in Ohio to examine the Jersey herd, from which it is supposed animals were sent to the Epler sale.

T. C. JONES.

Delaware, Ohio, *Sep.* 1*st.*

AN EXPLANATION.

DEAR SIR,—Will you oblige me by inserting the following in your pages. My remarks on the feeding of horses of the Royal Artillery at Secunderabad, must be taken to refer only to the time I was stationed there, up till when I wrote the article in which they appeared. Since then there have been numerous and considerable changes in the regulations with regard to feeding horses in the Madras Presidency, which must tend to the benefit of the service and to lessen the prevalence of Liver Congestion among the Army horses. When I mentioned the "authorities" in connection with this matter I of course, was indulging in no reference to individuals, but simply intended to convey what I stated, *i.e.*, that I had duly represented my views on this matter through the usual channel. I am glad to say that if we may judge from the modification in the Feeding Regulations, my views closely agree with those of the modifiers of those regulations, whoever they be. (Reference to your volume, xviii. p. 28).—Yours very sincerely,

Bangalore, *Sept.* 13*th.* JOHN HENRY STEEL, V.S., A.V.D.

"PROFESSIONAL ADVERTISING."

SIR,—Under the above heading, in the VETERINARY JOURNAL for the present month, you give place to a paragraph taken from some local paper puffing a member of the profession.

Being in the town of Sheffield lately, I found my way to the theatre, and, paying a penny for a programme of the night's performance, I was not a little surprised to find in this said programme the following advertisement :—

NELSON & FLETCHER,

VETERINARY SURGEONS

(Members of the Royal College of Veterinary Surgeons),

ELLIN STREET, MOOR, SHEFFIELD.

Special attention paid to Diseases of Dogs.

Medicines Supplied upon Application by Post or otherwise.

INFIRMARY FOR HORSES AND DOGS.

Surely, Mr. Editor, we are not reduced to this extremity! What would be thought of any member of the medical profession who adopted such a practice? And yet many of us are struggling to take our place by their side, and to rank socially with them.

> "The fault, dear Brutus, is not in our stars,
> But in ourselves that we are underlings."

Advertising on a theatre programme, and in company with the following :—"Buy Tyler's Boots," "Furnish on the Hire System," "Try Davy's Sausages," "For a splendid Twopenny Cigar go to——" etc., etc.

It is to be hoped that this is not a fair sample of the means my fellow-members of the Royal College of Veterinary Surgeons are required to adopt at Sheffield to eke out a living.—Yours, etc.,

A PROVINCIAL PRACTITIONER.

SIR,—I am glad to say that I am not responsible for the paragraph headed "A Successful Veterinary Surgeon," which "Etiquette" sends you, with his own caustic comments thereon, as my "advertisement." Until my attention was called to it, I did not know of the announcement which appeared as an item of "Local News," *not as an advertisement, and without my knowledge or desire.* "Etiquette" is inaccurate also in saying that the *same* paragraph or, as it pleases him to call it "advertisement," appeared in two local papers at Wrexham. He has been careful to send the more glaring one. At the same time he *quite* forgot to send you the advertisement, or professional announcement, from the same newspaper for which I *am* responsible. This I enclose for your perusal. I am sure you will agree there is nothing unprofessional or "degrading" about it.

If "Etiquette" has anything further to say, let him please disclose his name, and I will meet any charge he has to make fairly and openly. I have a strong suspicion that if he had signed himself "Petty Jealousy," the *nom de plume* would have been a more appropriate one.—Yours, etc.,

Wrexham, *8th October*, 1884. JOHN ROBERTS, M.R.C.V.S.

THE ROYAL COLLEGE FUND.

DEAR SIR,—With reference to the suggestion made by you in the editorial for September, for an annual subscription of ten shillings from each member of our profession, individually I shall be glad to subscribe that sum, or one guinea per annum, as may be required, as soon as the matter may be decided on, and the necessary arrangements made for the receipt of the subscriptions.—I am, dear sir, yours very truly,

Woolwich. JOHN B. W. SKOULDING, A.V.D.

NOTICE.—Pending the publication of the second and concluding part of Fleming's "Text Book of Operative Veterinary Surgery (Special Operations on Organs and their Appendages)," it is requested that the following corrections may be noted for the first part, recently issued:—page 14, line 12, for "one-third inch," read "one and one-third inch;" page 47, line 15, for "preventible," read "preventable;" page 69, line 26, for "admitting," read "administering;" page 72, line 8, for "arthrotme," read "arthrotom;" page 72, line 11, for "cachée," read "caché;" page 132, line 26, for "trunk," read "thumb;" page 138, line 23, for "inside," read "outside;" page 226, line 49, for "latter," read "former;" page 257, line 38, for "vessel," read "missile;" page 263, line 30, for "spheroidal," read "sphenoidal."

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. Dyer, Limerick; J. H. Steel, A.V.D., Madras; W. D. Gunn, A.V.D., Madras; A. W. Hill, London; Professor Walley, Edinburgh; J. B. Skoulding, A.V.D., Woolwich; A. E. Macgillivray, Banff; T. C. Jones, Ohio; P. Cagny, Paris; P. S. Abraham, Dublin; T. Greaves, Manchester; G. A. Banham, Cambridge; J. Lambert, A.V.D., Woolwich; P. R. Gordon, Queensland; E. A. Hollingham, Red Hill; F. Spencer, Wragby; E. Beddard, Wolverhampton; J. Roberts, Wrexham; W. R. Burke, A.V.D., India.

NEWSPAPERS: *Lahore Civil and Military Gazette; Indigo and Tea Planters' Gazette; Leeds Mercury; Times; Manchester Guardian; Broad Arrow.*

BOOKS AND PAMPHLETS: *H. Bouley*, La Nature Vivante de la Contagion; *M. E. Aureggio*, Recherches sur les Affections Farcino-Morveuses du Cheval et de l'homme; *J. M. Wehenkel*, Bulletin du Comité Consultatif pour les Affaires Relatives aux Epizooties; Resumé d'une Enquête sur la Propagatione des Affections Charbonneuses en Belgique; Bulletin de la Société Royale Protectrice des Animaux de Belgique; 'Srijks Veeartsenijschool de Utrecht; Programma der Lesson; Bulletin et Mémoires de la Société Centrale de Médecine Vétérinaire; Report of the United States Treasury Cattle Commission for the year 1883; *J. M. Wehenkel*, Compte Rendu du IV^e^ Congrès International de Médecine Vétérinaire; Report on Anthrax amongst the Horses at Bangalore; Cape of Good Hope, Report by the Colonial Veterinary Surgeon; *A. Liautard*, Animal Castration.

JOURNALS, ETC.: *Journal de Médecine Vétérinaire et Zootechnie; Medical Times and Gazette; La Presse Vétérinaire; Revue Vétérinaire; Clinica Veterinaria; Live Stock Journal; Repertorium für Thierheilkunde; L'Echo Vétérinaire; American Veterinary Review; Edinburgh Medical Journal; Recueil de Médecine Vétérinaire; Medical Press and Circular; Archives Vétérinaire; British Medical Journal; Lancet; Œsterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Der Thierarzt; Der Hufschmied; Wochenschrift für Thierheilkunde und Viehzucht; Quarterly Journal of Veterinary Science in India; Tidskrift för Veterinar-Medicin och Husdjursskötsel; The Practitioner; Animalia; Chicago Live Stock Journal; Animal World.*

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

DECEMBER, 1884.

ON SCAPULO-HUMERAL DISLOCATION IN THE HORSE.

BY P. S. ABRAHAM, M.A., B.Sc., F.R.C.S.I., MEMBER OF THE COURT OF EXAMINERS, AND CURATOR OF THE MUSEUM, OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

DISLOCATIONS of the shoulder appear to be amongst the most rare accidents to which the horse is liable. The majority of writers on veterinary surgery either do not allude to such a lesion, or, if they do, they dismiss it in a few words as an almost impossible occurrence. Such a high authority as Youatt, speaking of the humerus of the horse, says, "Dislocation can scarcely occur in either of the attachments of the bone;" and an older author, Blaine, maintains that the idea of dislocation at the shoulder in the horse being possible, "is founded on an ignorance of the anatomy of the animal." From the absence of a clavicle, the whole shoulder girdle is so movable, the articular surfaces of the humerus especially are so large, and the two bones are so strongly bound together by a mass of great tendons and muscles—notably by the huge tendon of origin of the flexor brachii, which works in two large and deep grooves in front of the head of the humerus—that it really is difficult to understand, *à priori*, how a scapulo-humeral luxation can take place. Professor Williams, in his work on "Veterinary Surgery," relates a case, witnessed by him when a youth, which he thinks must

have been a dislocation of the shoulder :—" A horse slipped and fell ; when he arose, one fore-leg was found powerless, pendulous, shorter than its fellow, and bulging outwards at the shoulder-joint. He was taken to a stable, where he immediately lay down, groaned in agony, was very restless, and unable to rise to his feet. A practitioner, who was sent for, pronounced the shoulder to be out ; he secured the animal's other legs by means of hobbles, applied ropes to the lame limb above the knee and at the pastern, and had several men to pull steadily at the ropes to cause extension. When all was ready he slipped his boots off, and suddenly jumped with force on the damaged joint, which immediately gave a kind of crack, and the bulging suddenly disappeared. The ropes and hobbles were now removed, the horse assisted to his feet, when he was found to be nearly well, and walked home a distance of about three miles that night." An acquaintance has recently informed me that a similar accident happened to a horse of his in the hunting-field some years ago. The animal breasted a fence ; when raised, he stood on three legs, and a hard lump bulged out at the shoulder. The injured leg was firmly held down, the horse reared up, and in the act he states that " the joint came right with a click."

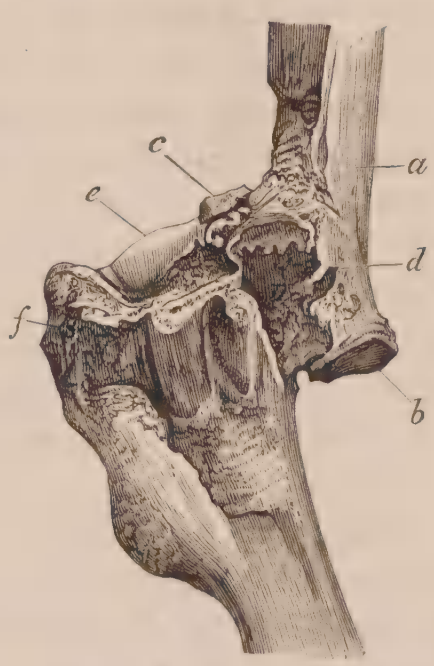
Finding the literature of the subject so scanty, and as I could hear of no specimen at all similar to the one I am able to exhibit to-night to the Pathological Section of the Academy, I wrote to the Royal Veterinary College in London, and to the Editor of the VETERINARY JOURNAL, the pages of which I had searched in vain. Professor Robertson, Principal of the College, and Mr. George Fleming, F.R.C.V.S., the eminent President of the Royal College of Veterinary Surgeons, and Editor of the JOURNAL, kindly answered my inquiries; and both gentlemen remark in their letters upon the extreme rarity of the accident. In more than thirty years Professor Robertson has " only met with two instances, and both were displacements of the head of the humerus backwards and outwards." He states that there is no specimen in the Museum of the Royal Veterinary College. Mr. Fleming refers to the case mentioned by Professor Williams, quoted above, and he informs me that a still more detailed

description is to be found in Stockfleth's "Handbuch der Thierarztlichen Chirurgie."*

The accident, in my case, happened thus:—The horse, a very spirited animal, took a fence intemperately, near the finish of a long run with the "Ward Union" hounds. The jump was a little short, and he fell across the crest of a narrow bank at the far side of the dyke with his off fore-leg bent under him, and inwards. He wriggled over into the field beyond, and lay on his side for about a quarter of an hour. When got to stand up, a marked deformity at the shoulder was at once apparent—a large hard protuberance, which seemed to lie forwards and outwards from the lower end of the scapula. From the prominence upwards the contour of the shoulder was rather concave. There was but little apparent shortening of the limb, very slight turning in of the toe, and the animal seemed able to rest some weight upon the leg. In consequence of this latter fact, the general opinion of the horsemen who happened to be on the spot was that the shoulder was not "out." However, I made a feeble attempt at extension, but without the least effect. The horse was then led to the nearest station, the distance being nearly three and a half miles. Now that we know what really happened, it is extraordinary that the poor horse could have moved along. He was, of course, fearfully lame, but beyond an occasional stumble against a stone with the bad leg, he got over the distance without mishap in an hour and a half. He was then brought up to Dublin by train, and taken to the nearest veterinary surgeon, who considered that one of the shoulder muscles had been ruptured. The treatment adopted was an immediate blister. There seemed to be a general agreement of opinion on the part of the profession that no dislocation existed, and that any attempt at reduction would be ridiculous. After a time a leather shield was tightly strapped over the prominence by another practitioner, who also felt confident of the horse's ultimate recovery. Naturally, however, the shoulder, by degrees, became more stiff—progression soon being solely on three legs; the shortening of

* This dislocation has been observed in horses, cattle, and dogs, and it, as well as its treatment, is described in my "Text-book of Operative Veterinary Surgery," Part I., page 155.—G. FLEMING.

the leg became more marked, and the toe turned more inwards. The wasting of the muscles of the shoulder was now extreme; and a sore was observed on the withers—no doubt caused by the tight strap which held on the leather shield. Finally, ten weeks after the accident, Tetanus set in, and the poor animal was put an end to by an overdose of chloroform. At the *post-mortem* examination none of the shoulder muscles presented any evidence of rupture; but the tendon of the flexor brachii was tightly stretched, and directed outwards, and the capsular ligament was ruptured. The exact condition of the soft parts was, however, difficult to make out, after such a length of time from



Shoulder-joint seen from the front, from a photograph of the bones after maceration:—*a*. Neck of scapula; *b*. Glenoid cavity of scapula; *c*. External edge of glenoid cavity broken off and pushed up; *d*. Coracoid process; *e*. Head of humerus; *f*. Great trochanter of humerus.

the date of the injury, and in consequence of the large amount of callous and inflammatory tissue in the neighbourhood. The scapula and humerus were firmly united together, and not the slightest movement could be effected between them. With considerable force they were broken apart, and the rough surfaces of contact now show that considerable bony ankylosis had set up between the bones in their new position. The humerus is seen to be dislocated on the dorsum of the scapula—*i.e.*, the head of the bone has been forced outwards and upwards,

its level being nearly three inches above the level of the glenoid cavity of the scapula. Rather more than an inch of the outer edge of the glenoid cavity has been broken off and pushed up, and is now to be seen ankylosed on the neck of the scapula in the line of the spine. The scapula and humerus were fixed at an angle corresponding to a position of the limb between extension and flexion. The actual condition of affairs is well seen in the accompanying engraving, which is from a photograph (kindly taken by my friend Dr. R. A. Hayes) of the bones in their new position—the view being a front one. The bony prominence—which, as I mentioned above, could be seen and felt at the time of the accident—lying apparently in front of the joint, was caused by the anterior projection of the great trochanter, which is situated on the outer side of the bicipital groove. This gave the appearance of a dislocation of the humerus forwards, and I erroneously imagined that the head had probably lodged beneath the coracoid protuberance of the scapula. Such an occurrence could scarcely, however, take place in consequence of the immense development of the bicipital tendon.

There can be little doubt that reduction would have been quite possible in this case. Of course considerable traction would have been necessary, but the horse should have been anæsthetised, and the only difficulty would have been in fixing the scapula. On the other hand, it is not likely that a completely successful result would have followed; for, as we see, the glenoid edge was fractured, and the probability is that a stiff joint would have resulted.

THE RELATIVE VALUE OF SUBJECTS TAUGHT THE VETERINARY STUDENT.

BY THOMAS GREAVES, F.R.C.V.S., MANCHESTER.

(*Continued from page* 315.)

In continuing the consideration of this subject, I wish it to be clearly and distinctly understood that, in judging the capacity of a student, a due and reasonable regard must always be made for his age. It would be unfair to expect him to possess that clear

and prompt decision—that wisdom—that quality of acuteness of perception—which is only acquired by long intelligent observation and experience. The degree of knowledge the student, at twenty-one years of age, is reasonably expected to possess on all subjects appertaining to his profession should be readily and plainly demonstrable to the examiner. It is true the students are unequal in intelligence and in moral purpose, and, unless a student has some written evidence to show that he has ever been engaged amongst sick and lame horses, the examiner has no guarantee that such student knows anything whatever of general practice, except by *seeing him do the work itself.* What chance, I would ask, have the examiners of satisfying themselves of the student's practical qualifications on the day of examination? There are scores of operations that it would be utterly impossible for the student to perform before the examiners in the brief space of time allotted them; yet the *examiner is obliged to vouch for them.* The student may never have castrated a colt, or seen it done; may never have unnerved a horse, or seen it done; may never have attended a case of parturition, or seen it done; may, in fact, never have seen a sick or lame horse as a patient in his life, only the few cases he may happen to have seen at college—yet the examiner must certify that such student is fully competent to perform these and every other operation required in our profession. Much has to be inferred; the examiner has to assume (without proof) that he knows it whether he knows it or not. Is not this, I would ask, a farce—a veritable farce—on the very face of it? We are told that all the theoretical subjects must, of necessity, be taught and acquired, whether the practical be taught or not, because they are of first importance, and it is the only chance the student has in his life to acquire and perfect himself in them. The subjects are botany, materia medica, chemistry, anatomy, physiology, histology, morbid anatomy, horse and cattle pathology; but it is contended that the practical knowledge is not of such paramount importance, as it may be obtained or learned after the student has left college—that he will become more and more proficient in this department of his studies as years roll on. He must, forsooth, gain this experience at the expense

and loss of his employers; as Mr. Moore and the late Mr. John Lawson often used to say, "Such a one will have to fill a ten-acre field with *his victims*, in acquiring the experience he ought to possess before he obtained his diploma." *The above opinions are in direct opposition to the opinion often expressed by Coleman, Dick, Spooner, and Wilkinson.* But what are the objections, let me ask, to the pupilage? I have put the question to several professors; *they one and all give me the same answer.* They say the youth who has been trained in the work of his profession, who has become familiar in diagnosing and in the treatment of all kinds of sick and lame cases in general practice, before going to college, is always A CONCEITED MAN. This is the great fault —the heinous, insuperable objection to pupilage. Conceited, forsooth! This conceit has to be taken out of him; it has all to be unlearned; the knowledge that has been so carefully, so diligently, so sacredly implanted in his mind is worse—much worse—than useless. They say it always makes him the worst of students; it matters little or nothing who or what the general practitioner may be who has inculcated the ideas; it may be he is a person of education, of mature age and experience; or it may be he has only lately emerged from one of those scientific institutions, and possesses all the modern ideas and the profound knowledge of the present day equal to the professor himself. It is all the same; these ideas acquired in actual practice must be ruthlessly expunged, and none have place in the student's mind but those precious ideas specially instilled by the learned professor himself. They would have us believe that the mind of the student must be fed by no mental food except that prepared for him by professors, on pain of being poisoned. Is this, I would ask, a tangible proposition? Does it not contain elements of dictation and superciliousness? I would here ask is it because such student can, when asked, tell the lame leg correctly, can diagnose pretty acccurately the disease a patient is labouring under, that this is construed into conceit? But, on the other hand, the student whose mind is utterly innocent of all knowledge of horses is never considered a conceited man; he can attend college with clean hands, in lavender kid-gloves, silver-mounted cane, white cambric hand-

kerchief, scented with a sweet perfume that permeates all the locality—yea, he may also have a fox's tooth in his hat, and a horse-shoe pin in his scarf, but he is never conceited. Oh, no; it is only the practical student that is conceited. For the life of me, I can see no tangible reason—there is really no earthly reason whatever why the practical student should be conceited more than any other student, or be supposed to be from some family of a lower stratum of society, or from a more vulgar or less cultured class than he who knows nothing of horse knowledge.

The Students.

The professors say: "Let all students come up to college perfectly free from all preconceived notions about horses; let them be in complete innocence and ignorance of veterinary practice." They say, in effect, "Let me have a clean bill of fare, then I can mould him into what he ought to be." An inordinate fondness for veneering prevails; some prefer polish to solid acquirements. Well, now, let us for a moment look carefully, fairly, and dispassionately at this question. Let us take two students, just as they are stepping over the threshold into the college. They shall be about twenty or twenty-one years of age each, of about equal education and capacity to learn: the one has served a pupilage of two or three years in a bustling general practice under an intelligent and smart practitioner—been engaged all the while from morning until night daily amongst sick and lame horses, cattle, etc.; the other's mind has not been contaminated by having seen, read, or heard of sick or lame horses or cattle, etc. We ask the former one, "Let me see you give that horse a ball and a drink;" he does it at once, without bustle or trouble. He is then asked to insert a seton in throat, and also one in the frog—he does it at once, without bustle or trouble. He is asked to clip, fire, and blister a horse's legs, then put on hobbles and cast a horse; he does it at once, without bustle or trouble. He is asked to take up a cow's fore-foot and a hind-foot, and to put a sheep upon its back; he does it at once, without bustle or trouble. He is asked to diagnose a case of lameness and also a case of sickness; he does it at once, without bustle or trouble. In doing these things he puts himself in

proper form, goes about his work with ease, and is handy in his work; he puts himself and his horse in ship-shape, so to speak; all who see him see that he is accustomed to the work and knows what he is doing. We now come to the other student. We ask him to do these several things. Of course, he knows nothing whatever about them; he is as innocent and as ignorant in these matters as a child; he has all this to learn—if it is worth learning—whereas the other has already learned it; he has learned it whilst his mind and his nature are most impressionable. "We look upon this picture and then on that," and ask ourselves which of the two seems best fitted to become the most useful man? They then enter upon the scientific study of the laws that govern disease.

We now take our leave of these students for three-and-a-half years. They mingle in the classes. They study and learn botany, materia medica, chemistry, anatomy, physiology, histology, morbid anatomy, horse and cattle pathology. Before parting, we strongly advise both students that it should be the aim of all young men to go into good society—the society of the wise, the intelligent, and the good. When you find men who know more than you do, and from whose conversation you can gather information, it is always safe to associate with them. To elevate the character—to improve the life—there must be strength of will, power of self-denial, persevering effort. It is the habitual thought that frames itself into our lives; it affects us more than our immediate social relations do; our confidential friends have not so much to do in shaping our lives as thoughts which we have harboured. In observing the ways of good business men, whether they be students or veterinary surgeons, you will always find that each man makes his special business his life's work, and studies it thoroughly, sticks close to it through good times and bad times; economy in every way is strictly enforced; no work or means of any kind is wasted; no opportunity missed; no want of strict business method.

The student or veterinary surgeon must possess a kindly, pleasant, agreeable manner and demeanour, so as to make friends, and become respected; his conversation must be marked by a thoughtful intelligence, be interesting and instructive; his

observations about horses, or on diseases, or about his patient in particular, must be terse, and possess common sense, indicating the possession of a superior knowledge and a cultivated mind. Make all your remarks well to the point, concise, and suitable to the occasion; the importance of this instruction is only felt and taught in the business of the profession.

We now meet our two students again after three-and-a-half years' interval. We ascertain that they have been average students; have been steady, and attentive to lectures, etc. The one has applied himself diligently, and especially to all subjects except pathology; that subject to him has been of secondary importance, since he had seen practice before entering college, and he could bestow the whole of his time and his mind more usefully to the study of the other subjects, and thus learn them more thoroughly. The other student, although equally diligent, has had to devote much of his time and attention to obtaining some idea of pathology as taught at college, which, by-the-bye, is a very different thing altogether to that adopted and necessary in general practice, in which he has hereafter to get his living. We now put them again through the same ordeal we did when they entered college; they have now obtained their diplomas, and are both medallists (I may say, in parenthesis, that the higher order of practical student always shows a superiority over the non-practical student, not only in his being a more successful practitioner in after life, but also in carrying away the majority of prizes at college). We find the two students—the one is quite as forward in his knowledge as the other in every scientific subject, none of which subjects seems to be of the same value or importance as tact and business habit. The one with only college ideas of practice, finds, when left to himself in practice, to be contending with many disadvantages, and quite at sea. However well he may have mastered the various other subjects—however scientific he may be—he cannot yet diagnose a case of lameness correctly, and cannot cast a horse for the life of him. (This statement is vouched for by the late John Wilkinson, Mr. James Collins, and many others.) He is sure to feel a want of confidence in himself. He is for many years tormented with conflicting, scientific, and mystifying appre-

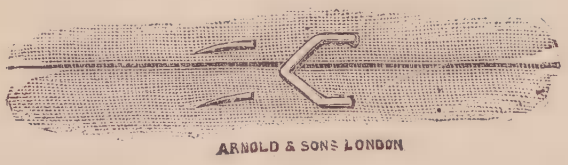
hensions, which only time, close observation, and a tenacious resolve can in part, but which will never entirely, remove.

(To be continued.)

A NEW FORM OF SUTURE FOR APPROXIMATING THE EDGES OF WOUNDS. (PATENTED NO. 13196.)

INVENTED BY MR. J. MACMUNN.

I BEG to submit to the notice of the profession a form of suture which, in my opinion, would be useful, and might, in certain cases and in certain situations, supersede with advantage the ordinary means of approximating the edges of wounds. I am not aware that such a contrivance has been used before, although the age of the thread suture, and the absence of recent attempts to modify its principles of fixation, would seem to indicate that it has reached the stage when modification is unnecessary and impossible. Nevertheless, the suture is objectionable in ways which will immediately suggest themselves to anyone who reflects for an instant on its application. It fails to approximate the walls of a wound in a desirable manner; only too often bringing into contact the limited superficial portions of the tissues corresponding to where the threads are inserted, and leaving the deep parts unapproximated. There is a circular constriction, which frequently leads to ulceration and strangu-



lation of the tissues enclosed within it, and thus to uselessness of the suture; while this defect is not at all times caused by a too-tight application, but is indirectly owing to the smallness of the body which bears the strain of the tissues. The suture acts as a foreign body in the wound, and causes those conditions which are known to prevent early union. These not being imaginary objections, but based on experience, I wish to suggest the following form of suture as fulfilling indications not met by the ordinary interrupted suture, and being at the same time easy

of application. These sutures may be very readily introduced by a torsion forcep, which is made to grasp the V-shaped bend while the fingers of the left hand approximate the edges of the wound ; after which, if the wound is not thoroughly closed, the wire may be clamped at the bend, and the points brought closer together, with or without being held by a thread or a piece of cork fastened on them. A piece of folded lint may then be applied under the bend to afford support to the wound. The sutures may be introduced either in the long axis of the wound, which is preferable, or across it, when a foreign body would, of course, be present. These sutures may be had of various thicknesses, sizes, and curves, hardened lancet-shaped points, manufactured by Messrs. Arnold, of Smithfield.

SKIN DISEASE DUE TO A NEMATODE WORM.

BY GEORGE FLEMING, LL.D., F.R.C.V.S.

THE interesting paper from the pen of Mr. W. D. Gunn, Army Veterinary Department, on "The Pathology of Skin Disease prevalent among Troop Horses in India," and which appeared in the last number of this journal, deserves particular notice from the fact of its containing the discovery of a nematode worm, which appears to have been the cause of annual attacks of a cutaneous disorder. The discovery of a worm of this order in this situation is only so far a novelty in that it has been noted in India ; inasmuch as in 1868, Professor Rivolta published in *Il Medico Veterinario* a description of a minute worm which he had found in the skin, producing great irritation and an eruption, and which he named *Dermofilaria Irritans*. And in the April number of the *Revue Vétérinaire* (page 166) Professor Laulanié, of the Toulouse Veterinary School, evidently not aware of Rivolta's discovery, has a paper on "The Parasitic Nature of Granular Dermatitis," which is evidently the same disease as that alluded to by Rivolta as caused by a filaria, which disease had been named by Professor Bouley *Dermite Granuleuse*. The malady had long been popularly known in France by veterinarians and others by the name of "Summer wounds" (*plaies d'été*),

and in Germany as *Knötchen-Ausschlag des Pferdes, Sommerräude, Hitz Knötchenausschlag.* Laulanié's discovery appears to have been accidental, as his investigation into the nature of the skin disease had no other object than the exact determination of lesions of the derm, and the nature of the granulations which more particularly distinguish this morbid condition. The fundamental anatomo-pathological character of the malady is due to the presence of a large number of granulations, in different stages of development, disseminated throughout the substance of the derm. These granulations, examined by the naked eye, appear to be composed of a small irregular mass of a caseous nature and consistency, which is readily enucleated ; practising in making sections and fragments of skin previously hardened, the granulations are variously exposed at different parts of their substance, where they can be examined throughout. This is the only kind of examination which Laulanié could avail himself of, as he was unable to find a re-agent capable of dissolving the caseous or calcareous substance of which the granulations are composed. The caseous masses on section were in the form of yellowish, and circular, elliptical, or irregular pieces, surrounded by a zone of connective tissue, the elements of which were more or less altered by the casefication, with a fibrous outline. In the centre of each piece was observed a section of one or more fragments of a nematode worm, whose integument presented the characteristic streaks or stripes. The various aspects which the fragments offered proved that the worm had been curved in an irregular spiral manner. It sometimes happened that no traces of the worm were found in some of the caseous masses, but in the place which it should have occupied there was an irregular cavity with a notched outline, or organic *débris*, very evidently the remains of a nematode worm which had been dead for some time.

The secondary lesions of the skin were merely the expression of an inflammatory process, the intensity of which appeared to depend upon the period of the year when the diseased skin was examined. In one of his first observations, made in winter on fragments of skin removed from a horse affected with Granular Dermatitis without sores, Laulanié found the characteristic

granulations, with the worm in the centre. The skin was very much thickened, and, as it were, sclerosed. In some points there were remarked transverse sections of small arteries in process of obliteration and fibrous transformation, the lumen of the vessels only offering a very fine star-shaped outline.

His second observations, made on the skin of a troop horse, showed alterations manifestly of a sub-acute character.

The derm was infiltrated with embryonic, and especially fibroplastic, elements, which were abundantly interposed in the connective and fibrous fasciculi. The small vessels—very numerous—were often filled with leucocytes, particularly those vessels passing to the granulations of the sore. There were also, as in the preceding observation, small arteries undergoing obliteration.

From his investigations, Laulanié arrived at the following conclusions :—

1. Granular Dermatitis is caused by a nematode worm.
2. The parasite occupies the centre of a cheesy mass, surrounded by a fibrous capsule.
3. It persists for years in the granulations to which it gives rise, and thus becomes a permanent cause of irritation of the skin.

The latter conclusion was arrived at from the nature of the process of casefication, which implied a very long period.

It may thus be inferred that Granular Dermatitis is a continuous affection, the duration of which is only limited by the death of the parasite which causes it, and the periodical acute manifestations of which are incidents determined by elevation of temperature. Clinical experience lends its support to these pathological observations, inasmuch as the disease persists during the warmest weather, no matter how energetic the medical treatment may be ; while it invariably recurs in horses which have once been attacked with it. In a word, it is a periodical disease, and most difficult to cure. Its periodicity is explained very clearly by the nature of the morbid cause rendered evident by histology. The presence of the worms does not cause any disturbance during winter, but in summer, owing to the natural congestion of the tissues which results from increased tempera-

ture, the parasitic granulations situated in the centre of the tissue become more irritable, and there develop the first signs of sub-acute inflammation, accompanied by pruritis, which causes the animal to rub and gnaw itself. Hence the excoriations and the sores, which are all the more persistent as the exposed derm becomes more impressionable, and more sensible to the irritating effect of the granulations.

When the temperature diminishes, the congestion of the skin decreases, the pruritis lessens, the sores become cicatrised, and the new-formed tissue undergoes fibrous transformation.

With regard to the inefficacy of the treatment hitherto employed, this is readily explained by the histological characters of the parasitic granulation. The nematode occupies the centre of a caseous mass, very thick and dense, when compared with the size of the worm, and impermeable to therapeutic agents.

Laulanié believes that before the worm localises itself in the skin it circulates in the blood, to which it gains access by some unknown means ; the vascular alterations observed in his specimens leading to this supposition.

In order to prevent the disease, we must know the source whence the nematode is derived ; and in order to cure it, the worm must be attacked either during its resting stage in the skin, or some agent must be employed during its active period in summer, sufficiently powerful to dissolve or destroy the fibrous and caseous envelope which protects it at that period.

Editorial.

THE PRACTICAL EDUCATION OF STUDENTS AND VETERINARY SURGEONS.

Our last article on Practical Education has attracted so much notice, that we make no apology for continuing our remarks on the subject. We briefly offer to our readers some further important considerations, in the hope that efforts will be made on all sides to bring about a much needed and permanent improvement. It will, we venture to think, be generally allowed that the shortcomings detailed in our former number refer only to the groundwork of the student's education, and that the points noticed may be truly described as belonging to the very rudiments of professional teaching. It is, perhaps, not as widely known as is desirable that within the last two years the rejections of candidates for the Army Veterinary Department have been mainly due to their deficiency in practical and manipulative skill, the number who failed being about fifty per cent. This army examination cannot by any means be called severe, as the candidates are not taken on any uncommon operations—in fact, they are only tested in the usual and ordinary ones. It may, however, be described as a more searching trial than the practical examination for the diploma, as it lasts about three hours, and plenty of horses are provided for inspection. All the usual operative instruments are also laid out, so that the candidate may practically illustrate their use one after the other. He has to examine horses for age and soundness, and to write certificates, and also prescriptions. He is also shown cases of disease, and tried in his powers of diagnosis and treatment. All these tests may be said to constitute a true practical examination, yet no one will describe it as severe; and we have no doubt that, with the march of progress, our examination for the diploma will be conducted on similar lines. We may further state, for general information, that the practical examination of army candidates occupies one day; another day is devoted to the written examination, so as to ascertain whether the candidate possesses a fair scientific acquaintance with his profession; and from the style of the written answers a good idea may be obtained of the general knowledge and education of the aspirant. In this written examination there are always some questions on Cattle Pathology, which is of great importance to army veterinary surgeons in India and other parts of our foreign dominions. No question, however, is asked that a young veterinary surgeon cannot reasonably be expected to know, and ample time is afforded, so that the papers may not be written with disadvantageous haste. In future, in the army examinations, it is probable that more attention than has yet been the case will be given to what we may call practical anatomy. If a veterinary surgeon does not know the situation of the different parts and organs of his patient, it is found that he is afraid to perform even simple operations; and he keeps animals for a long time from their work, in the hope that he may, by some fortunate chance, be spared the use of the operating knife which he so much dreads to employ. This is very often seen, and shows that a diligent study of practical anatomy should be enforced on the student, and that the final examination should be proportionately severe. No one

who has experience of many veterinary surgeons can fail to see how frequently horses, and other patients too, are kept for a long time from usefulness, and often lost, through the fear of the practitioner to perform what is, in very many cases, a simple operation. We have frequently observed that ignorance of the parts to be operated upon is almost always the cause of this deplorable failure of duty. May we not say that no student should be allowed to shirk practical dissection and anatomy? If he does, he cannot become an efficient or trustworthy practitioner. We might almost go so far as to say that an empty dissecting-room is a great anomaly during any part of a session, and the amount of dissection is a fair indication of the value of the whole curriculum of study. We may well ask why so many young veterinary surgeons are unable to tell in which leg a horse is lame? For the great majority the answer is not far to seek. It is want of practice. In our college-time it was the almost daily custom for two or three students to go along the streets in company, and notice the lame horses trotting by—numerous enough in all large towns—and compare opinions as to which was the affected limb. We commend this plan to earnest and industrious students as being time exceedingly well spent. Surely young veterinary surgeons should know something about the quality of hay, oats, and other foods given to their patients; and they should be able, in any given specimen of hay, to pick out the good and bad feeding grasses. This is easily and quickly learnt. This knowledge is very essential in the army, and quite as much so to the civilian veterinary practitioner. In order to acquire it, practice is again required, but how easy to obtain it will occur to everyone. The question will doubtless be asked: But how is it that with all these deficiencies examiners have passed candidates as qualified to receive a diploma? The answer to this is that examiners cannot go beyond the general knowledge of the pupils, or the rejections would be overwhelming. They have to do the best they can with those who present themselves for examination. The examiners will, we feel sure, be only too glad to find that candidates know the rudiments and groundwork of their profession. What is found to occur in the examination of candidates for the army—that fifty per cent. fail from want of practical and manipulative skill—shows us that it is useless to expect success in students who are deficient in the rudiments of their profession. There must be something to be amended in the method of teaching when the very foundation is wanting. In concluding for the present our remarks, we may truly say that what we have described has for a long time been discussed in the profession, and the only wonder is that so many deficiencies have not long ago been removed. We confidently submit to all veterinary associations and well-wishers of the profession that reform is urgently required, and that all should co-operate to abolish what at this time of day amounts to a grave scandal. We feel equally confident that the energetic principals and teachers of our colleges will devise means to ensure that their pupils shall no longer escape learning the practical rudiments of their profession. We hope soon to see a rivalry in practical instruction established, for of all branches of teaching it is the one least to be dispensed with in the successful education of the veterinary surgeon.

THE PENNSYLVANIA UNIVERSITY.

It gives us very much pleasure to announce that Dr. Osler, of the McGill University and the Veterinary College, Montreal, whose name will be familiar to the readers of this journal, has been elected to the chair of Clinical Medicine in the above university at Philadelphia. He is about to visit this country in order to deliver the Gulstoninian lectures at the Royal College of Physicians of London. We may also notice that a Veterinary College has been established in connection with the Philadelphia University, and that the selected principal is Dr. Huidekoper, a graduate of the New York Veterinary College, who has also studied at several of the German and French veterinary schools, and rendered himself in every way competent for teaching the science and practice of veterinary medicine in its highest and latest development. We anticipate excellent results from the institution of this college, under the able and enlightened directorship of its principal. We have received the following account of the veterinary department of the Pennsylvania University from an esteemed correspondent there:—

"On the 2nd of October the new veterinary faculty of this university was formally opened with an introductory address by Dr. Huidekoper, the dean. Owing to the liberality of several of the citizens of Philadelphia, suitable buildings have been erected, and laboratories fitted for junior work. The plan is to begin this session with a first-year class only, and next year have stables etc., arranged for advanced work. As they stand, the buildings are the best on the continent, and afford admirable facilities for laboratory work. There is a lecture-room, capable of holding 200, a spacious dissecting-room with ten tables, a forge with ten anvils and all appliances for practical shoeing, and histological and pharmacological laboratories. The students take their practical chemistry and the general chemical lectures in the medical school. An excellent beginning will in this way be made. Twenty-four students have already entered, and we predict for the school a splendid career of usefulness. It is proposed next summer, when the infirmary is built, to start a school of farriery, where men can be practically trained and receive a certificate as expert shoers. The course in the veterinary school extends over three sessions of nine months each."

HORSE-POX.

Dr. Blachez recently brought to the notice of the Academy of Medicine, an epidemic of Horse-pox which lately took place at the Hospice des Enfants-Assistés. The malady was first observed in the nursery into which none but syphilitic infants, or those suspected to be such, are received. One of the infants had an ulcer on the lower lip, with enlargement of the neighbouring glands, and the ass that suckled it had a deep excoriation on the teat, which was noticed two days before the ulcer in the child. The animal so infected had for fifteen days suckled another infant that had an ulcer on the tongue, which naturally gave rise to suspicions of Syphilis.

The epidemic went on extending, when MM. Fournier and Bouley were consulted as to the nature of the prevalent malady. M. Fournier was doubtful as to its nature, but M. Bouley, the well-known veterinarian, at once pronounced it to be Horse-pox, the origin of which had to be sought for. It was noticed that another infant, who had been admitted twelve days previously, had both its arms covered with vaccine pustules, which were dressed by the "infirmier," who, having his fingers thus affected, inoculated the teats of the suckling asses. Other asses were also similarly affected, which was sufficient to account for the origin of this strange epidemic among the infants.

"EL DOURINE."

THE very fatal contagious sexual disease of solipeds known to the Arabs as "El Dourine," to the Germans as the "Beschalseuche," and to the French as the "Maladie du Coit," appears to have been on the increase lately in Algeria. To such an extent has it prevailed in Constantine, and so serious have been its ravages, that the Préfet of that Department has issued a decree setting forth that, during the season, mares and stallions—equine and asinine—are not to be brought together until they have been inspected by a veterinary surgeon, who will certify that they are healthy and likely to produce healthy stock, which certificate will be legalised by municipal authority.

CATTLE PLAGUE IN EGYPT.

IT is a matter for regret and anxiety that Cattle Plague is reported to have appeared among the cattle collected for the use of the British troops in the Soudan, as it may cause not only heavy pecuniary loss, but prove a source of embarrassment to the Commissariat. The scourge is never absent from the Delta of the Nile, and it has also been several times imported from Southern Russia. During our military operations three years ago in Lower Egypt, the disease was brought there by Russian cattle from Odessa (as it now has been), and but for its prompt recognition and suppression by the veterinary officers of the army, it would have done serious damage. We hope that they may be equally suc- cessful in combating the present outbreak.

PRZEVALSKY'S WILD HORSE.

GREAT interest is attached, says *Nature*, to the question of the origin of our domestic animals, and especially to that of the horse—which is generally supposed not now to exist in an aboriginally wild state. Every fact bearing upon this subject is of importance, and the discovery by the great Russian traveller, Przevalsky, of a new wild horse, more nearly allied to the domestic horse than any previously known species, is certainly well worthy of attention.

The horses which constitute the genera *Equus* of Linnæus, and are the sole recent representatives of the family *Equidæ*, fall naturally into two sub-genera, as was first shown by Gray in 1825 (*Zool. Journ.*, i., p. 241)—*Equus* and *Asinus*.

The typical horses (*Equus*) are distinguishable from the asses (*Asinus*) by the presence of warts upon the hind-legs as well as upon the fore-legs, by their broad, rounded hoofs, and by their tails beginning to throw off long hairs from the base, instead of having these hairs confined, as a sort of pencil, to the extremity of the tail. Up to a recent period all the wild species of *Equus* known to science were referable to the second of these sections—that is, to the sub-genus *Asinus*, known from *Equus* by the absence of warts or callosities on the hind-legs, by the contracted hoofs, and by the long hairs of the tail being restricted to the extremity of that organ. Of this group the best known species, commonly called wild asses and zebras, are (1) the wild ass of upper Nubia (*Equus tæniopus*), probably the origin of the domestic ass; (2) the wild ass of Persia and Kutch (*E. onager*); (3) the hemippe or wild ass of the Syrian Desert (*E. hemippus*); (4) the kiang or wild ass of Tibet (*E. hemionus*); (5) the quagga (*E. quagga*) of South Africa; (6) the Burchell's zebra (*E.*

Burchelli) of Southern and Eastern Africa; (7) the zebra (*E. zebra*) of Southern Africa. As already stated, these seven animals all possess the characters of the second sub-genus *Asinus* as above given, and no recent species of horse referable to the first sub-genus (*Equus*) was hitherto known to exist on the earth's surface, except the descendants of such as had been formerly in captivity.

Under the circumstances great interest was manifested when it was known that Przevalsky, on his return from his third great journey into Central Asia, had brought back with him to St. Petersburg an example of a species of wild horse which belonged, in some of its characters at least, to true *Equus*.

This new animal was described in 1881 in a Russian journal by Mr. J. S. Poliatow, and dedicated to its discoverer as *Equus Przevalskii*.

The recently-issued German translation of Przevalsky's third journey enables us to give further particulars of this interesting discovery.

Przevalsky's wild horse has warts on its hind-legs as well as on its fore-legs, and has broad hoofs like the true horse. But the long hairs of the tail, instead of commencing at the base, do not begin until about halfway down the tail. In this respect *Equus Przevalskii* is intermediate between the true horse and the asses. It also differs from typical *Equus* in having no forelock—that is, no bunch of hairs in front of the mane falling down over the forehead. Nor has Przevalsky's horse any dorsal stripe, which, although by no means universal, is often found in the typical horses, and is almost always present in the asses. Its whole general colour is of a whitish grey, paler and whiter beneath, and reddish on the head. The legs are reddish to the knees, and thence blackish down to the hoofs. It is of small stature, but the legs are very thick and strong, and the head is large and heavy. The ears are smaller than those of the asses.

Przevalsky's wild horse inhabits the great Dsungarian Desert between the Altai and Tianschan Mountains, where it is called by the Tartars "Kertag," and by the Mongols "Statur." It is met with in troops of from five to fifteen individuals, led by an old stallion. Apparently the rest of these troops consist of mares, which all belong to the single stallion. They are lively animals, very shy, and with highly-developed organs of sight, hearing, and smelling.

They keep in the wildest parts of the desert, and are very hard to approach. They seem to prefer especially the saline districts, and to be able to do long without water.

The pursuit of this wild horse can only be carried on in winter, because the hunter must live in the waterless districts, and must depend upon a supply of water from melted snow. As may well be believed, such an expedition during the severe cold of winter into a remote part of the desert must take at least a month. During the whole time of his stay in the Dsungarian Desert, Przevalsky met with only two herds of this wild horse.

In vain he and his companions fired at these animals. With outstretched head and uplifted tail the stallion disappeared like lightning, with the rest of the herd after him. Przevalsky and his companions could not keep near them, and soon lost their tracks. On the second occasion they came upon them from one side, yet one of the herd discovered their presence, and they were all gone in an instant.

The single specimen of Przevalsky's horse subsequently procured is now in the Museum of the Academy of Sciences of St. Petersburg, and is the only example of this species in Europe.

Proceedings of Veterinary Medical Societies, &c.

ROYAL VETERINARY COLLEGE.

THE Session opened on October 1st, and among others present were H. G. Sutton, Esq., in the chair; Lieut.-Gen. Sir F. Fitzwygram, Bart., M.P., and Sir James Tyler, Governors of the College; Professors Pritchard, Williams, Walley, and McCall; Messrs. Dray, Greaves, H. J. Cartwright, Cope, Peele, Borthwick, T. S. Price, T. Dollar, Banham, P. Taylor, W. Wilson, Stainton, E. M. Davey, Geo. Williams, and Simonds.

The CHAIRMAN, in introducing Professor Brown, said: We are met together to-day at the invitation of the Principal and the Professors of this College to hear the introductory address to be delivered by Professor Brown, the veterinary adviser to Her Majesty's Privy Council. I feel sure it is a great pleasure to the Professors of this College to see so many gentlemen met together to show their interest in the work of the College, and to hear this address.

Professor BROWN: Mr. Chairman and Gentlemen, the custom of delivering an annual address at the commencement of the winter session of this College has its uses. It enables the lecturer to touch upon certain current topics which will be outside his ordinary functions. It permits him, if he feels so disposed, to offer to those who are commencing their studies a little good advice, albeit not always free from the apprehension that such advice is sometimes more blessed to him that gives than to him who takes it. Then, also, if he feels so disposed, he may improve the occasion by moralising a little on the flight of time, the stuff that life is made of.

As members or students of a profession which has high aims and grand objects, it will not be uninteresting to us to try and find out what is the exact position we occupy in the economy or house law of the *polis* or State. We have clearly certain duties to perform, and we are, although we may not clearly realise it, servants of the State, and not its masters.

One of our great masters of English prose (Mr. John Ruskin), in an "Essay on Political Economy," says that there are five typical professions which are necessary to the wellbeing of all civilised communities. There is the pastor to teach it, the physician to keep it in health, the soldier to defend it, the lawyer to administer justice, and the merchant to provide. He goes on to remark that it is the business of each one of these to live by his profession. Well, gentlemen, we do not meet you with any initial difficulty here. Possibly some of us might even be disposed to contend a little too strongly for the circumstance of the living; at any rate we are not disposed to dispute the fact that "the labourer is worthy of his hire," although it happens not unfrequently that this quotation, coming from the higher Authority, is referred to with something like fiendish ingenuity as an apology for all sorts of extortion and robbery. If you remember under what conditions these words were first spoken, it will probably occur to you that the persons addressed were really labourers, and not amongst those who were inclined to take their work luxuriously. They were told also when they entered a place to take just exactly what they could get, and not concern themselves too much about its quantity or quality. In fact, this hire which they were to accept was a very small thing indeed, and not uncommonly consisted of buffetings and public scourgings. Not pushing the point too far, we may allow that all of us are justified in living by our profession. But there is a consequence which the writer to whom I have referred draws from this proposition which might not be quite so acceptable. He says all are justified in living by their profession, and all are bound on due occasion to die for it—an idea by no means so easily accepted; a conclusion which

requires something in the way of proof. Well, gentlemen, let us spend a few moments in seeing how far this principle may be carried. What is the due occasion on which a man is to sacrifice his life for the benefit of his profession? We shall have no difficulty at all in regard to one of the professions. If I refer to that of the soldier, who is to defend the State, you will recognise the fitness of the position. In his case it is his duty to carry his life in his hand, and he is bound to die rather than turn his back upon the enemy in the face of battle. We clearly understand that "a discharge of artillery may mow into a level line of red clay an advancing regiment, and that out of the separately Christian named portion of that ruinous heap may go forth some essential condition of soul unwillingly released." The noble soldier who honours us to-day with his presence would shudder at the suggestion that the men under his command would quietly seek a place of safety under the plea that it was their business to live by their profession, and not to die for it. Well, gentlemen, take another instance: the pastor is bound to die rather than countenance the teaching of error, and we are disposed to admit this. We know, as a fact in history, that thousands of pastors have died cheerfully rather than countenance the teaching of error; and we should see the extreme unfitness of the case if it were once clearly shown to us that the teacher had deliberately chosen to teach what he knew or believed to be wrong, merely because the sacrifice of his life would have been the penalty of his refusal. Then, if we go to the physician, we are still treading on perfectly safe ground. He is called upon to die rather than quit his post in time of plague. It would certainly seem a strange proceeding if he were to attempt to quit his post under such conditions. We heard lately of the inhabitants of a city flying in terror from the advancing cholera; but it would seem monstrous if all the doctors in the place had packed their portmanteaux and taken the first train away from the threatened city. Therefore we have no difficulty in their case, and these three are all that concern us. I may say shortly that the writer contends that the lawyer is bound to sacrifice his life rather than countenance injustice, and the merchant rather than supply bad quality or false quantity of food; but I feel a certain amount of difficulty in carrying the argument farther, and it is not at all essential to my present purpose.

My object now is to inquire what is our due occasion of dying for our profession, admitting that we are, under ordinary conditions, justified in living by it. As a section of the medical body we take our position amongst the first three professions referred to. As the physician has to keep the people in health, so the veterinary physician or doctor has to keep the animals in health; and it will be an interesting point for us to inquire how, under these circumstances, it can possibly ever be incumbent upon us to sacrifice our lives in the performance of our duty. In touching this question, allow me to suggest that by the terms "losing his life" I include necessarily all minor sacrifices: the greater contains the less; and if it be shown that the physician is bound to sacrifice his life rather than quit the post of duty, it may be fairly allowed that he is bound to sacrifice time, talent, money, ease, all that goes to make up life, when the work which he is called upon to do necessitates such a sacrifice.

We are of course, gentlemen, by the mere accident of circumstance, exempt to a large extent from the risks which touch the human physician, but our history is not wanting in instances of martyrs to the cause of science. There are cases from time to time which show that the veterinary surgeon is perfectly ready to face the risk of contact with a disease which may be fatal to himself, not only without flinching, but commonly without thinking of the results. I give him credit commonly for risking his life without flinching when, if the question were fairly put to him, he would not risk any

of his money. It is constantly the case that when a man's heroism is allowed to have its fair chance of displaying itself, that he proves equal to the occasion, but in smaller matters the question may arise whether or not he might frequently fail to take the position which he ought to occupy from an ill-grounded and somewhat slavish fear of the consequences. Now, we are justified in asking what are the particular conditions under which we may be called upon to sacrifice anything at all. I have already admitted that we are bound to live by our profession, but in allowing that, gentlemen, let me ask you to take it as a point which might be proved if time would allow it, that you are not to make the living by the profession the essential point. You are not to put yourselves in that category of men who are described by the writer to whose works I have already alluded as the "fee-first men" —the men who prefer their fee to their work. To put it more plainly, you may know distinctly whether or not you are in the right way by deciding whether you would rather save your fee and lose your patient than you would save your patient and lose your fee. I believe myself that you, all of you, when fairly put to the question, would elect to save your patient at all hazards—in fact, that you would elect to do the work thoroughly, quite without reference to the amount of fee you would get for it. But I am not quite certain that you have always succeeded in conveying that idea to the public. We hear constantly a great deal talked about the importance of maintaining the interest of the veterinary profession. We hear very little indeed about the higher interest of the large body of stock-holders who are the owners of some 45,000,000 of animals which constitute the animal population of this kingdom. If you succeed in conveying the impression to these men that your primary object in carrying out your duties, which are, recollect, to maintain that cattle population in health—not only to cure its diseases, but to prevent them—if you succeed in conveying the impression that you think more about the fee than you do about the performance of the work, you may depend upon it that they will not ask for your assistance ; but if you will, on the other hand, lead them to believe that you take a delight, as all chosen workmen do, in the work—that you are more anxious to do that work well than to get your fee for doing it, I, for one, entertain the conviction that the relationship between the veterinary surgeon and the agriculturist would be closer in a short time than it ever yet has been in the history of either profession.

You may inquire in what way you are to proceed? Gentlemen, the ways are numerous enough. In your ordinary practice there is such a thing as thorough work to do, not a mere glancing at the case under your notice, but a complete analysis of everything connected with it, a certain evidence of painstaking which the looker-on appreciates thoroughly, even though he may not exhibit any signs of his appreciation. There are works of investigation still to be carried on, problems in pathology yet unsolved, and as far as we can see, not in the right way of solution for some time to come ; and there are your official duties, in which a very considerable portion of the profession are now engaged under the laws relating to diseases of animals. In this matter alone it is unfortunately the case that there is an apprehension abroad that the work is done in proportion to the pay, and no more unfortunate presumption could be possibly allowed to find its way into the public mind. It should clearly be made evident that the veterinary surgeon considers himself bound to aid wherever his advice can be of use, and that he is prepared at all hazards to do the work which he finds to do thoroughly, whether he gets paid for it or not. You have heard perhaps the story of that sculptor who was engaged in carving with accuracy of detail the back of the head of a figure which was to adorn a temple. The lookers-on derided him. "What," said they, "devote all that time and skill to carving a part of the figure which is to be

sunk into the wall! None will see it!" "The gods will see it," was the answer. Take that side by side with another story which I listened to a short time back. Two workmen of the period were discussing their grievances, as workmen of the period do sometimes, but not always with sufficient reason. One complained that some one had offered him half-a-crown to beat a large carpet and he refused it. The other said, "Well, I should have taken the half-crown and beaten the carpet accordingly." There you have them, gentlemen, the two sharply defined, the heathen sculptor on one side and the Christian workman of the nineteenth century on the other. One placed himself in that category of which it is said, "You that take your work first and your fee second are the servants of God, you who take your fee first and your work second are the servants of the fiend."

Gentlemen, there can be no question that our course as professional men is perfectly well defined. We are bound on all occasions to recognise our high responsibilities to the State. Your fees are necessary to you; you have families to support; you have a position to maintain; but whenever the fee is made first and the work second, the work is necessarily badly done. When your whole soul is thrown into the business before you, you take the position of the chosen workman whose greatest delight is in the contemplation of his own finished work.

Having sketched thus cursorily the position and objects of our profession, let me address myself to those who are now commencing, or are here to continue their studies. You have come here to learn the art, and I was going to say the mystery of medicine, but I say the art and science of medicine. The mystery of medicine belongs to the time of the alchemists and other magicians—it is of no use to you now. You may try to maintain your nostrums handed down from your great-grandfathers, and you may be most sedulous to avoid publishing them for the benefit of the world, but the world does not care a straw about them. All the popular literature of the day is replete with the most exact and laboured scientific information. Every agricultural paper refers to the experiments of Pasteur and Koch and other continental pathologists, as well as those of our own school. If you want to realise clearly what I mean by the public literature of the day in connection with the advance of science, purchase the *Pall Mall Gazette* for yesterday and read that. I won't tell you what you will find, because it is quite worth the trouble and expense of obtaining the copy for yourself. If you do not thoroughly realise the truth of the proposition which I have suggested, that all mystery in the art of medicine is for ever gone, it must be on account entirely of your mental obtuseness, and not for the want of the fact being apparent. Well, I say, you have here to learn the art and science of medicine applied to the lower animals, and you will find at the existing veterinary colleges remarkable —may I be permitted to say fatal?—facilities for acquiring knowledge.

I look back some quarter of a century, and I remember that the whole curriculum of this institution was in the hands of Professor Spooner, Professor Simonds, and Professor Morton, "each name a household word." Each man had his work well cut out for him; and if you look at the results of the teaching of that time, as exhibited by those gentlemen who have honoured us with their presence to-day from distant parts of the country, you will require no statement from me to prove that the teachers' hearts were in their work, and that they did not belong to that list of fee-first men. But look at the present condition of the educational staff. You have every section elaborately arranged for your convenience. You have the subject of the pathology of the horse treated by Professor Robertson, whose long experience and power of expressing his ideas leave very little indeed to be done by you, beyond the exercise of necessary attention to enable you to take full advantage of his instruction. You have the subject of physiology separately introduced by a

distinguished member of the human school (Mr. Power). You have the subject of parasitic disease brought under your notice by the highest authority in this country, probably one of the highest in Europe (Dr. Cobbold). In chemistry you have the whole of the vast experience and the elaborate arrangements which Professor Tuson has brought to bear upon the subject for your benefit. You have Professor Axe to teach you morbid anatomy, and you have the subject of clinical medicine and demonstrations in the anatomical theatre dealt with by competent officers. Under this extended system of tuition you are not asked even to seek for the mental food which you require—it is collected for you with elaborate care, triturated into a fine assimilable condition, and positively thrust into your mental stomachs, very much in the way that men feed poultry for the market. It is quite conceivable that in taking your learning in this luxurious way you may fall into a somewhat somnolent condition; in short, that you may over your studies fall asleep, and work them out in a dream. The lethargic attitude, gentlemen, is not the normal one. The condition which you ought to assume is the opposite to the lethargic condition; your attitude should be the fighting attitude. We are told that war is the foundation of all art and of the higher virtues and faculties of man. The common opinion that peace and the virtues of civilised life flourish together is a wholly untenable position, and the vices only neutralise life. We hear of "peace and learning," "peace and plenty," "peace and progress;" but these are not the words that the muse of history couples. The words on her lips are, "peace and sensuality," "peace and selfishness," "peace and corruption," "peace and death." "All great nations have learned their truth of heart and strength of foot in war. They have been taught by war and betrayed by peace; they are born in war and expire in peace." It is not, however, of all wars of which this may be said. There are creative and foundational wars, as well as wasting and oppressive wars; but it is of the foundational and creative war that I am speaking, and I tell you that you are bound to enlist yourself as soldiers in the ranks of those who carry it on. There are giants to be slain in these days, as in King David's time—ignorance, prejudice, and a host of others—and they are only to be knocked over by smooth stones chosen with accurate skill from the brook which flows for ever from the fountain of knowledge, and when chosen they must be sent straight to their mark in the name of the Lord, in the name, that is, of the eternal verities, and with absolute rightness or righteousness of aim.

Gentlemen, the object of your ambition is placed on the top of a hill; it is an Acropolis, the highest point in the Capitol. It is your business to struggle ever upwards and onwards, and according to the efforts which you display here, where you may meet with all possible aid and sympathy, will be your efforts in the great arena of the world, where you are far more likely to meet with strenuous opposition. But without discouragement go on; I say to you, go on and prosper, as you will according to your deserts. And I conclude in the words of a sentiment which used to form, and probably does now form, a part of the solemnities at the convivial meetings to which students are occasionally addicted—"In ascending the hill of professional prosperity may you never meet a friend."

List of Medals, Class Prizes, etc., awarded at the Opening of the Winter Session, 1884-5.

COLEMAN PRIZES.

Silver Medal	Mr. John Edward Rickards.
Bronze Medal	Mr. Edward Taylor.
Certificate of Merit	Mr. George Henry Evans.

CATTLE PATHOLOGY PRIZES.

Silver Medal	Mr. Edward Taylor.
Certificate of Merit	Mr. Samuel Cliffe.

SCHOLARSHIP.

£25 per Annum for Two Years ...	Mr. Charles A. Lye.
Very Highly Commended	Mr. P. G. Bond.

CLASS PRIZES.

CLASS C.

Hippopathology	Mr. John Edward Rickards.
Cattle Pathology	Mr. Henry Smith.
Morbid Anatomy	Mr. John Edward Rickards.
Helminthology	Mr. John Edward Rickards.

CLASS B.

Anatomy	Mr. A. Cawdle.
Histology	Mr. C. Winteringham.
Physiology	Mr. A. Cawdle.

CLASS A.

Chemistry and Toxicology	Mr. P. G. Bond.
Materia Medica	Mr. J. D. Roberts.
Practical Chemistry	Mr. W. T. Wilson
Botany	Mr. W. T. Wilson. } *aq.* Mr. A. Moore. }

Certificates Awarded.

FOR ACTING AS CLINICAL CLERKS.

Mr. Axe, H. J.
„ Williams, T.
„ Barrett, A.
„ Langdon, W.
„ Burghope, L.
„ Higgott, T. H.
„ Snowball, W. D.
„ Baker, T.
„ Hewitt, T. G.
„ Gill, A.
„ Skelton, C. F. H.
„ Smith, H.
„ Evans, G. H.
„ Cliffe, S.

Mr. Reid, W. S.
„ Heinemann, C. W.
„ Pemberton, H. L.
„ Golding, G. H.
„ Rickards, J. E.
„ Hammond, J.
„ Whigham, W. B.
„ Blanchard, S. J.
„ Drewitt, W.
„ Bazley, F.
„ Brooks, W.
„ Butler, E. R.
„ Stear, G.

FOR ACTING AS MONITORS.

Mr. Axe, H. J.
„ Singleton, H. M.
„ Skelton, C. F. H.
„ Evans, G. H.

Mr. Hammond, J.
„ Smith, H.
„ Rickards, J. E.

FOR ACTING AS PROSECTORS.

Mr. Axe, H. J.
„ Gill, A.

Mr. Butler, E. R.
„ Rickards, J. E.

FOR ACTING AS ASSISTANTS AT THE SMITHFIELD CLUB SHOW AT THE AGRICULTURAL HALL, DEC., 1883.

Mr. Butler, E. R. | Mr. Heinemann, C. W.

FOR ACTING AS ASSISTANTS AT THE ROYAL AGRICULTURAL SOCIETY'S SHOW AT YORK, 1883.

Mr. Taylor, E. | Mr. Hammond, J.

New Students.

Mr. James E. Allen.
" Henry E. Allen.
" F. B. Drage.
" Jonathan James Fry.
" James Wooding.
" William Owen.
" William A. Stainton.
" Edward R. McHugh.
" Thomas E. Barcham.
" Edward J. Porter.
" Frank B. Ditmas.
" William W. Goldsmith.
" William Folsetter.
" F. Harvey.
" Charles N. Parsons.
" James R. C. Hogg.
" Alfred E. Gostling.
" Samuel B. Baker.
" James A. Worsley.
" Frederick W. Watchorn.
" Alfred E. Branch.
" Harry Hall.
" Joseph Healy.
" John C. Collings.
" Louis Mitchell.

Mr. James A. Legg.
" Arthur Crapp.
" James W. Crowhurst.
" Harold H. Rocke.
" John H. Jones.
" William A. Clifford.
" Harold S. Briant.
" Samuel Wharam.
" Robert Wilson.
" William R. Elstone.
" James Sherley.
" Frederick Walmsley.
" William Price.
" Augustus C. Newsom.
" T. A. T. Hutton.
" Thomas L. Bickford.
" William J. Moran.
" Thomas Spencer.
" E. Ainsley.
" W. L. Gardener.
" F. Aulton.
" Sidney J. Williams.
" William H. Willsher.
" E. E. Stokes.
" John T. McLean.

ELIGIBLE TO COMPETE FOR SCHOLARSHIP TO BE AWARDED AT THE CLOSE OF THE SUMMER SESSION, 1885.

Mr. E. Ainsley.
" T. L. Bickford.
" W. A. Clifford.
" T. A. T. Hutton.

Mr. A. C. Newsom.
" T. Spencer.
" F. W. Watchorn.

The CHAIRMAN remarked that although feeling his inability sufficiently to discharge the duties which his present position entailed upon him, he had nevertheless great pleasure in being present on this occasion. He thanked Professor Brown in his own name, and for those who had now listened to his address. He desired to say that the Governors of the Royal Veterinary College, whom he now represented, were ever most anxious to assist in every way in promoting the interests of veterinary science, particularly as represented by this College. He felt indebted to the lecturer for the manner in which he had placed the subject of the study of veterinary medicine before intending students, and he trusted that, pursued with such motives as he had pointed out, the result would be lasting benefit, both to the public who might require the services of veterinary surgeons, and to the practitioners themselves. He was pleased on this occasion to be able to state that, in regard to the general work of the College, both as a teaching institution and an hospital for sick

animals, where the actual details dealt with in the lectures might be carried into practice, it was in a fairly satisfactory condition.

PROFESSOR ROBERTSON, in moving a vote of thanks to the Chairman for his presence on the present occasion, drew attention to the fact that in thus conveying our thanks to the Chairman we were acknowledging our indebtedness to a body of gentlemen, the Governors of the Royal Veterinary College, whose representative the Chairman was. These gentlemen, from the most disinterested motives, and often at considerable inconvenience to themselves, had for nearly a century exercised a fostering influence in respect of the study of veterinary medicine in Great Britain ; while, from his own knowledge, he could testify to the steady anxiety they had always exhibited to further in every way the interests of this College and of the profession.

GLASGOW VETERINARY COLLEGE.

THE winter session of this institution began on 29th October, when the introductory address to the students was delivered by Principal M'Call. The proceedings took place, as usual, in the lecture-hall of the college, at 83 and 85, Buccleuch Street, and there was a large attendance—Dr. J. B. Russell in the chair. In addition to a large number of students, the following gentlemen, among others, were present :—Rev. R. Blair, Cambuslang ; Rev. Mr. Scott, Easterhouse ; Rev. A. R. Story, Carmunnock ; Rev. D. Watson, Woodside Church ; Dr. Moore, Greenhall, Blantyre ; Dr. Knox, Royal Infirmary ; W. Lucas, Esq., Writer ; John Wordie, Esq. ; J. Cuthbert, Esq. ; J. M'Intosh, Esq. ; D. Forsyth, Esq., M.A., B.Sc. ; W. Moore, Esq. ; James Miller, Esq. ; Professors Limont, Cooke, Macqueen, Renfrew, and Stewart, Glasgow Veterinary College ; Professor Lewis, New Veterinary College, Edinburgh. The following veterinary surgeons were also present : —G. H. Fenton, A.V.D. ; Mr. M'Gill, London ; Messrs. Houston and M'Geoch, Paisley ; Mr. Robinson, jun., Greenock ; Mr. Kerr, Dalry ; Mr. M'Gregor, Ayr ; Mr. Bowie, Stranraer ; Mr. Campbell, Kirkcudbright ; Mr. Constable, Inchture ; Mr. Hunter, Dundee ; Mr. Freeland, Blairgowrie ; Mr. Brown, Holytown ; Mr. Jarvie, Carluke ; Mr. Nesbit, Galston ; Mr. M'Donald, Campbeltown ; Mr. Gabbie, Dundalk ; Mr. Gardner, Helensburgh ; Mr. Peddie, Cathcart ; Mr. Brownlie, Coatbridge ; Mr. M'Gregor, Dumbarton ; Mr. Taylor, Cathkin ; Mr. Allan, Clarkston ; Mr. M'Ilwraith, Milngavie ; Messrs. W. Anderson, R. Mitchell, J. Weir, Tweedley, Boyle, Frew, Wyper, Muir, and Wallace, Glasgow.

Prof. M'CALL said : Mr. Chairman and Gentlemen,—As is customary on all such occasions as the present, we inaugurate the duties of the winter session by the delivery of an introductory address to the students ; and as the veterinary horizon has for some time been clouded with subjects of grave importance, not only to the students, but also to the profession and the public, it has been considered advisable that I should deliver the introductory address to-day, and make these more especially the subject of my discourse.

I shall, in the first place, refer to the Royal College of Veterinary Surgeons—its constitution and powers, its Council, and Board of Examiners. In the second place, I shall speak of the results of the operations of the Contagious Diseases (Animals) Act, more especially within the City of Glasgow, and more particularly with reference to the disease Pleuro-pneumonia Epizootica in cattle, and thereafter conclude by offering a word of explanation and advice to the junior students.

Royal College of Veterinary Surgeons.

For the information of those who are not acquainted with the constitution and functions of the Royal College of Veterinary Surgeons, allow me to say

that it is not a teaching institution, and has no students of its own. It is a corporate body, composed of all the members of the profession, and its sole function is to examine the students of this and all other teaching colleges affiliated by Royal Charter to it, and to grant the diploma qualifying them to practise.

In 1876 it was decided by the Council of the Royal College of Veterinary Surgeons that the candidates for diploma should be subjected to three examinations, viz. — at the first to an examination in materia medica, pharmacy, chemistry, toxicology, and botany ; at the second to an examination on the anatomy of the horse and other domesticated animals, physiology, and histology ; and at the third and final, to an examination on morbid anatomy, and pathology, veterinary medicine and surgery, practical examination of horses and cattle as to soundness, age, disease, etc.

When the system was inaugurated I expressed myself as doubtful of its success, not that I so much objected to the three separate examinations as to the order and division of the subjects, and I regret to say that each year's experience seems to justify my doubts and to increase our difficulties. Time will not permit me to enter into details, still I think it is specially due to our first-year students to point out a difficulty with which they have to contend in passing their first examination.

I have just stated that materia medica is a subject of the first examination. Now, an examination in materia medica which only deals with the botanical or other classification, the preparation, the active principle or principles, and the standard dose, is a most unsatisfactory one—unsatisfactory alike to the examiner and the student—nay, I would say, unfair to both, and to the profession as well. The object of materia medica, in one sentence, is to put the student in possession of a remedial agent, having, or believed to have, in a greater or less degree, a definite or specific and curative action in a specific or given disease. Now, if such be the facts, it must be self-evident that the student can only apprehend the teachings of materia medica when he has comprehended the teachings of chemistry, anatomy, and pathology. Take, for example, the familiar drug, aloes. Its action, as most persons know, is purgative. Its dose, in a full-sized cart horse, is from six to eight drachms. Now in Pneumonia—that is, inflammation of the lungs—if such a dose be given, it will most likely produce congestion and irritation of the feet, or Laminitis—or congestion and inflammation of the bowels—super-purgation, and death. So that under these circumstances its action is not displayed as a purgative, but as a most powerful irritant poison. Then take a saline purgative in the ox, say sulphate of magnesia. The dose is from 1lb. to 1½lb. In constipation of the third stomach—inappropriately termed Omasitis—such a dose is no use, six times the dose may be no use, and six times that as well. A cow may have administered to her a small apothecary-hall of purgative medicine, and still the animal is not purged. Super-purgation, and death as a result, is almost unknown in cattle practice, but super-purgation and death in horse practice is much too common. No animal, not even man, comparatively speaking, is so easily and certainly purged as the horse, and no animal so rapidly succumbs to the action of a purgative. The lesson we learn from these facts is, under no circumstances freely purge a horse, and in active disease particularly avoid irritating the bowels. If you consult the older works on veterinary science, you will discover that the mortality in horses was very great in many diseases in which now we have but few deaths. And how has this result been brought about? Principally by avoiding bleeding and purging. I have not bled a horse for twenty-five years, and have discarded purgatives in the treatment of active disease for a like period, and I have not had a death from super-

purgation since I adopted this line of treatment. But to return to the ox: from the great volume of the stomachs, the weakness of muscular contractility and nerve power, purgatives are always uncertain, and in practice we find that, instead of multiplying the dose of the purgative, if we wish to rouse the stomach and bowels into action, we must restrict the purgative to a full dose, and follow it up by the administration of stimulants and nerve tonics in small and frequently repeated doses. A vast number of other medicinal agents have like peculiarities; now, of almost all these peculiarities, junior students can know nothing when they stand their examination in materia medica, for under the present system of tuition and examination they only enter on the study of medicine (disease) after they have passed their first professional examination. For the reasons stated, and others which could be specified, I hold that materia medica, instead of being a subject of the first examination, should be a subject of the third or final, and until it is so, the examination will remain unsatisfactory alike to teacher, student, and examiner.

Regarding the second examination, I have also to express dissatisfaction, but the students are largely responsible for the dissatisfaction to which I am about to refer; still the Council cannot be exonerated. I volunteer the opinion that the students who have graduated in this college since 1876 till the present time have not been as well grounded in anatomy as their predecessors, and I know that the same charge can be brought against the students of London and Edinburgh colleges. The reason is not far to seek. Under the old system of examination (antecedent to 1876) two years were spent, and earnestly spent, in acquiring a knowledge of anatomy; but under the new system by far the greater number of students in this and other colleges acquire all the anatomical knowledge they become possessed of in one winter session, namely, that following the first pass examination. Like all else done in a hurry, it is superficial, and it barely suffices to enable the student to pass the ordeal of an examination; several fail, and few, very few, pass a high standard.

I have always held the opinion that an intimate knowledge of anatomy was essentially necessary to the acquirement of a knowledge of pathology and the treatment of disease, and the more I learn the more I am convinced that the opinion is a correct one. If the students would devote a fair proportion of their time to anatomy during the first as well as the second session of their attendance at college, there need be little hesitation in predicting that, with the increased facilities for acquiring a knowledge of anatomy which exist in all the colleges, the students, under the new system, would not only equal, but excel those under the old.

But, as only a very few students, apparently, will interest themselves with anatomy during the first session, I contemplate, with the approval of the principals of the other colleges, moving the Council to delete materia medica from the first examination, and substitute a junior examination on anatomy at the end of the first session, covering, say, osteology and myology.

Passing now to the third examination, I would say that the subjects and the order of their arrangement are well chosen, and sufficiently diversified to test the ability of all candidates for the degree. Indeed, judging from the results of the past two years (since the appointment of the new Board of Examiners), it does appear that the subjects of examination are too numerous, or that the standard adopted by the new Board is too high, or possibly both.

As the third examination hinges almost entirely upon subjects which I teach, and as a considerable number of students have been rejected in this pass (but in justice to my students and myself, as small, if not a smaller,

percentage than in any other veterinary college), I have my own views as to how these results have been accomplished.

Shortly before the appointment of the Board of Examiners, as the pages of the *Veterinarian* and VETERINARY JOURNAL will testify, certain parties wished to prove that the time had now arrived when the profession should conduct its own examinations, and cast aside the assistance which it had so long received from medical and other scientific gentlemen.

Following in the wake, came the advocacy of the serving of an apprenticeship with a veterinary surgeon prior to the student entering upon his collegiate course, with, of course, the three years' services for nothing, and the hundred guineas premium less or more. These, with many in the profession, were looked upon as popular movements, and had strong advocates in the Council; but *had* the time come when the profession, and the profession alone, could conduct with like advantage the examination of its candidates for diploma, and *had* the time arrived when it was rendered imperative that our students should serve an apprenticeship? In neither case was it so in my opinion, and I found that the principals of all the colleges and a large number of the *élite* of the profession held the same opinion. However, the time came for the appointment of a new Board of Examiners, and the majority of the Council, by their vote, being in favour of dispensing with the services of medical gentlemen, the change was effected, and not only the medical gentlemen, but several other eminent veterinarians, who had for long acted as examiners, were deposed, and new examiners were appointed.

The Council had the power to appoint their examiners, and they did so. Elated with their success, now came the apprenticeship question to the front, but the Council, under their Charter, found that they had no power to stipulate for any such arrangement. Foiled, but not defeated, they applied to Government for a new or supplemental Charter, to give them the power they did not possess, and also to increase the fees for examination of students for the diploma from ten to thirty guineas. Believing, as I still believe, that serving an apprenticeship before entering college, is, in popular language, "placing the cart before the horse"—and quite as unnecessary in the veterinary profession as in the medical, in which it has for long been discarded—in consort with the principals of the Edinburgh colleges, I did what I could to frustrate the efforts of the Council, and I am glad to say that our united efforts, supported as they were by the influence of the Highland and Agricultural Society of Scotland, and the Town Councils of Edinburgh and Glasgow, had the effect with the Government of throwing out the apprenticeship clause, and of restricting the examination fee to thirteen, instead of thirty guineas. The new Board in due course entered upon their duties as examiners, and, I suppose, like the proverbial new broom, they felt it incumbent on them to "sweep clean," very clean, if not with a vengeance. The rejections under the old system ranged from five to fifteen per cent., but in the hands of the examiners for the final—and all at once—it ascended from fifteen to fifty per cent., and, lamentable to relate, some of the best students were included among the rejected candidates. Panic-stricken, the rejected students and their parents besought the principals of the colleges to explain the cause of the fatality, and the principals in their turn asked the examiners to explain; but nothing more satisfactory could be elicited than that the candidates could not answer the questions put to them, and that they were "a very ignorant lot." Entertaining the opinion that the students of this college were an *average*, and not an *ignorant* lot, and that somehow or other a serious misunderstanding had arisen, I put myself in communication with the other colleges, in the hope of eliciting some further information, but I found that they were in exactly the same position as ourselves

The only explanation, I suppose, that can be given under such circumstances is, that the new examiners had embraced new doctrines of disease, and new methods of treatment, and the students being grounded in the old faith, and ignorant of the new, consequently fell under their displeasure. The students, unfortunately, felt the consequences, but surely the examiners were wrong when they called them an ignorant lot. The ignorance—if ignorance was exhibited—I hold, lay with the teachers and the old examiners, and yet, if we make an individual comparison, all must admit that the members of the new Board are not competent to catechise the old Board, much less to set aside their opinion.

Not satisfied yet with the turmoil produced, an attempt was now made to take the educational examination of the students out of the hands of the colleges, and to place it in the hands of the Council and the College of Preceptors—an English institution unknown in Scotland. Having now had "a bite of the bridle" of our English friends—for be it remembered the new Board of Examiners and the Council of the Royal College of Veterinary Surgeons are almost composed of Englishmen and Londoners—and finding it rather distasteful, I objected to this interference and refused, with all deference, to obey the ruling of the Council.

Roused now to a sense, as I conceived, of injustice having been committed, and the urgent demand for reform, I set myself the task of endeavouring to elicit the cause of all this disturbance, and the need for it. Prior to the appointment of the new Board of Examiners it was alleged, as has been previously stated, that there was no lack of competent veterinarians to fill all the offices of examiners; that the office of examiner was highly valued, so much so that the profession could not afford to allow the honour to be shared in by medical men or other than members of the profession. But let us see how this is borne out.

By the Charter of Incorporation power is given to appoint twenty-two examiners, but strange to relate, the Council, instead of appointing twenty-two examiners, and dividing the honours about equally betwixt English, Scotch, and Irish practitioners, only appointed twelve, and of these, ten reside in England and two in Scotland, and consequently there is a not a single Irishman on the Board. The result of this arrangement has been the placing of the examinations of the students in the hands of a very limited number of men, and not only so, but, from the paucity of the examiners, one man alone acts at a table, and in some cases the same individual figures on more than one Board, and, of course, draws double fees. In my opinion no single examiner, however competent, should sit, or be allowed to sit, in final judgment on the candidates for admission to a profession. There should be two practitioners and one teacher on every table—the teacher to lead the examination in the lines of the most recent experimental investigation or research, and the two practitioners to examine more especially on the lines of every-day experience in practice, and to counteract any bias the teacher might display towards the student in the final award. Such a Board, as briefly indicated, would always give satisfaction, because it would compass all a student is taught or expected to know, and until some such an arrangement be made, no student, however well-grounded in his subjects, can calculate the result of his examination. But why were there only twelve examiners appointed? The Charter gave power to confer the coveted honour on twenty-two men, but twelve only received it, and of the number, two do not belong to the profession, and other two do not live by practising it. Why was it kept back? Were there only ten men in the profession competent to fill the office of examiner? If so, then it was not the fact, as has been alleged by certain persons, that there were a host of parties in the profession fit to fill the office of an examiner, and if so, it would have been

better not to have deposed the medical and other gentlemen who so efficiently, and to the satisfaction of all concerned, discharged the duties of examiners in the old Board.

But if it be affirmed that there were twenty-two competent examiners to be found in the profession, and they were known, then it follows that ten only were appointed, so that the individuals receiving the appointment might draw larger fees for their services, and that some of them might even fill a double office. And there does appear reason for sharing in this view, as the ten examiners have been drawing fees averaging from thirty to one hundred and thirty guineas each. If I have wronged the examiners by the inferences drawn from the facts stated, no one can regret it more than I would; and if I have done so, they have now an opportunity to put the real explanations before the profession, and thus right themselves; and if they can, you and I, and all well-wishers to the profession, will feel grateful to them. But to proceed, six members of Council retire (they are eligible for re-election), and six men are elected annually, in the month of May, to take their place. It was the Council who made the alterations I have referred to, and no other power than the Council can modify or alter them. With a view, then, to obtain a modification of them, I offered myself as a candidate for a seat in the Council, and, with the assistance of my professional brethren, I obtained it in May last; and I take this opportunity of thanking those who supported my claim by registering their vote in my favour.

At the first meeting of Council after my election I gave notice that at next meeting of Council I would move—"That at the 'C,' or 'final,' examination the number of individual examiners be such as is indicated by Bye-law No. 7, relating to examinations. That is to say, that two separate and distinct individual examiners conduct each department or section of that examination, or that four additional examiners for the 'C' examination be appointed."

That motion, gentlemen, came up for discussion in London on the 2nd of the present month, and I rejoice to say that it was not only carried, but carried with a unanimity which augurs well for further changes in the same direction. The motion was carried, and four additional examiners were appointed there and then, and these gentlemen will assist in the coming examination in January. General Sir Frederick Fitzwygram (who, although a nobleman by birth, yet takes the deepest interest in our profession) also gave notice that at next meeting of Council he would move that an additional examiner be appointed to all the tables; and Professor Williams' motion for disjoining the results of the practical and oral examination in the final, or 'C,' also comes up for consideration, and, should they be carried, I do hope that peace and harmony will again prevail.

At the last meeting of Council it was also arranged to place the matriculation examination of Scottish students in the hands of the Educational Institute of Scotland, instead of the English College of Preceptors, so that bone of contention has now been removed. Mr. Forsyth, who has for several years past conducted the matriculation examination in Glasgow, will continue to do so; and, judging from the interest he has in the past displayed in conducting this delicate and all-important duty, we look for good results in the future.

I have thus publicly referred to the circumstances which have of late divided the Council of the Royal College of Veterinary Surgeons and the teaching colleges and students, in order to put the minds of our pupils at rest, knowing, as I do know, how very much and how painfully they have of late been disturbed. And in leaving this disagreeable subject, I desire further to say that no more can the Council of the Royal College of Veterinary Surgeons succeed without the cordial aid of the principals and professors of the teaching colleges,

than can the teaching colleges without the hearty assistance and co-operation of their students. For the teaching colleges to disregard the interests of their students would be to destroy their own existence; and for the Royal College of Veterinary Surgeons to thrust upon the colleges and their students crude and ill-considered schemes is only to weaken its influence, and probably lead to its power (at least over the Scottish colleges) being cast aside.

It has been said that we in Scotland wish to have things our own way, and that if we don't get them we then threaten a Scottish Charter, but that we would not succeed with the Government in our application. Let any impartial mind view our position in the Council at the present time (thirty-one members, with five exceptions, all resident in England), and he will see that we can have little of our own way unless that way be very clearly the true way for the greatest good. And as regards our failing to obtain a Scotch Charter, the less said on that point the better; but it strikes me very forcibly that should the unfortunate day come when the three colleges in Scotland unanimously approach the Government for a Scottish Charter to grant degrees, it will take greater influence than the Council of the Royal College of Veterinary Surgeons can command to stay the hand of the Government. But I for one pray that the day may never come, or, at all events, come not so long as I am at the head of this institution; for while I advocate that there should be no monopoly in veterinary teaching, I do hold that there should, if possible, be no competition in the granting of diplomas. Long, therefore, may the Royal College of Veterinary Surgeons enjoy the sole monopoly of granting the veterinary degree in these kingdoms, but let her be all the more careful how she exercises this great privilege.

There is another point which must not be overlooked in the coming struggle, and that is the appointment of a larger number of Scotch and Irish practitioners, both in the Council and on the Examining Boards. The Royal College of Veterinary Surgeons is not an English institution, any more than an Irish or Scotch institution—it is all three in one. But the almost exclusive monopoly which English practitioners have for long enjoyed in filling its seats of power and honour has led them, more especially the London section, to regard it as their own, and to believe that they have but to resolve on a course of action, and we Scotch and Irish have but to obey. But it is not so; and the sooner they realise their true position, and arrange for a redistribution of seats on a fair basis, the more it will be to the advantage of us all, if we are to remain a united profession.

With these remarks, I now pass on to the consideration of *the past and present results of the operations of the Contagious Diseases (Animals) Act in dealing with Contagious Pleuro-Pneumonia in cattle, particularly in the City of Glasgow.*

An annual tax, varying in amount from the $\frac{1}{32}$ of a penny per £, having been levied in this city to meet the expenses connected with the slaughter and compensation to the owners of cattle affected with Contagious Lung Disease, has, of necessity, given rise to a variety of opinions as to the advisability of the measure. Some have viewed the action of the Government in this matter as partaking of class protection; the class protected with one party being the landlord, and with the other the farmer and dairyman. Much might be said in favour of either side of the question, but nothing is further from my thoughts at present than a discussion on such a subject.

That certain contagious diseases exist in animals, and have existed for a series of years in the past, and that the results of these epizootics has been the destruction of large numbers of our herds, is admitted by all. Acts of Parliament have been passed, and Orders of Council issued, to check their spread, and notwithstanding that they are not indigenous to this country, but imported, still they continue to exist; and the bare fact of their continued

existence has been sufficient evidence for a large section of the community making up their minds that the Acts and Orders, and the whole machinery connected therewith, are utterly valueless, and should be swept away. But, gentlemen, if you will bear with me, I think that I can prove to you that the measures referred to, if stringently applied, would so curtail the spread of these diseases, if not completely stamp them out, and so restrict the money to be levied as a tax, that the ratepayers would have no reason to complain. The grievance is to be taxed, and in some counties heavily taxed; and still contagious diseases continue to spread.

In Glasgow, thanks to our local authority, the various Orders of Council have been enforced with firmness and impartiality, but how many local authorities in Scotland, England, or Ireland, could conscientiously say the same? Not a large number, I venture to assert. But, if Glasgow, and some other local authorities I might name, can show good results from the operation of the Act in their hands, is it not, I ask, reasonable to infer, that most other local authorities might show similar results, if they would but do their duty, and employ properly qualified officials? I think so. What, then, have been the results obtained through the efficient working of the provisions of the Act in the Burgh of Glasgow?

We can most accurately estimate these, by first considering the losses resulting from the spread of contagious diseases in the burgh prior to the passing of the first Act, 1869.

Until the ever-memorable year of the Cattle Plague, viz., 1865, statistics were not available for demonstrating the losses resulting to the dairymen of Glasgow from the introduction and spread of Pleuro-pneumonia Epizootica, or other contagious disease. Having been instructed, by the magistrates of Glasgow, to make an examination of all the dairies and cattle-sheds within the city bounds, with a view to their being licensed under the Cattle-sheds and Burghs (Scotland) Act, 1867; and, also, to furnish statistics of losses sustained by dairymen during the prevalence of the Cattle Plague, I, at the same time, availed myself of the opportunity for collecting statistics showing the losses sustained from Pleuro-pneumonia. In order to make these statistics of practical use, in suggesting measures with the view to limiting the spread of disease, and, also, in demonstrating what a formidable enemy we had to cope with, I carried my inquiries, in every case where I could do so, as far back as the year 1853.

During the twelve years, then, prior to 1866, according to a tabulated statement which I published, 3,759 cows died within the dairies of Glasgow, affected with Contagious Pleuro-pneumonia, and 1,594 cows were slaughtered on account of being affected with the same disease. The money valu these animals was estimated at £54,677, thus representing an actual money loss of £4,556 per annum.

From the year 1866 till August, 1869, at which latter date the Contagious Diseases (Animals) Act became law, we have no statistics to guide us in estimating the loss by Pleuro-pneumonia; but from August, 1869, till the present day, I can give an accurate account of every animal which has died or been slaughtered within the Burgh of Glasgow, and affected with Pleuro-pneumonia.

From August, 1869, till August, 1872, 258 cows were attacked—139 were killed, 28 died, and 91 recovered from Pleuro-pneumonia. According to a computation on the same principles as form the basis of the tabulated statement referred to, the value of the cattle destroyed during these three years would be at the rate of £650 per annum.

In 1873 the Privy Council (for whom I also act as Inspector) issued an Order making it compulsory on the local authorities of England and Scotland, but not of Ireland, to slaughter without delay all cattle affected

with Pleuro-pneumonia, and to grant compensation to the proprietor *at the rate of one-half the actual value of the animal* prior to contracting the disease. Previous to this, compensation had never been given in Great Britain. Accordingly, in the month of August, 1873, I received instructions to carry out the provisions of the Order, and, with little variation, I have continued to do so until the present hour ; and let us now glance at the results.

In the year 1873-4, 203 cows were slaughtered, and £1,011 10s. 6d. was paid as compensation, being at the rate of one-half actual value. In the year 1874-5, 70 cows were slaughtered, and £502 16s. 9d. paid as compensation. In the year 1875-6, 73 cows were slaughtered, and £676 12s. 1d. paid as compensation ; the increase in the amount of compensation being largely due to the fact of the Privy Council having passed an Order that all local authorities were now to pay three-fourths the value of all animals slaughtered, instead of one-half as heretofore. In the year 1876-7, 111 cows were slaughtered, and £712 15s. paid as compensation. In the year 1877-8, 34 cows were slaughtered, and £194 15s. paid as compensation. In the year 1878-9, 54 cows were slaughtered, and £481 paid as compensation. In the year 1879-80, 39 cows were slaughtered, and £381 paid as compensation.

From August, 1880, till 1st July, 1884, *a period of four years, there were no animals affected with Pleuro-pneumonia, the disease was stamped out, and consequently the city had no compensation to pay.*

On 2nd July last we had an outbreak of the disease in a byre in Garscube Road, and it spread to two other cattle-sheds in the neighbourhood ; but the affected animals have been slaughtered, and I hope the disease has again been stamped out. If we now cast a glance backwards, and review the facts and figures, we find that for twelve years prior to the passing of the Contagious Diseases (Animals) Act, the losses sustained by dairymen in the City of Glasgow, by Contagious Lung Disease, amounted to £54,677, or a yearly sum of £4,566 ; but under a system of inspection and compensation, commencing in August, 1873, and extending down to July, 1884—viz., eleven years—the actual money loss has been reduced to £4,950, or £450 per annum, and the actual compensation paid has been £3,960 9s. 9d., or at the rate of £360 per annum ; or, in other words, under the system of inspection, and with compensation to the stock proprietor, *the annual loss has descended from* £4,566 *to* £450, *and, moreover, it has been demonstrated that Pleuro-pneumonia may be stamped out.*

Regarding the treatment of Pleuro-pneumonia, I am not in favour of inoculation, but immediate slaughter of all affected animals, as, by doing so, the disease is not only stamped out, but, on an average, one-half of the animals in the herd do not contract the disease, or if they do so it is in such a mild form that it would be highly injudicious to slaughter them.

In Edinburgh, as is well known, inoculation has been, and is still, largely practised, and if the reports contained in the blue-book annually published by the Privy Council be correct, I should say that it is anything but a success ; but whether or no, two things are certain, that when you inoculate you do not produce the lung affection in the animal inoculated, and that Pleuro-pneumonia is seldom, if ever, absent in the cow-sheds of the City of Edinburgh.

In Ireland, I regret to say, that the disease is never absent, more particularly in and around Dublin.

A short time ago I was consulted, through Dr. Marwick, our indefatigable Town Clerk, by a member of the Cattle Disease Committee, South Dublin Union, regarding the prevalence of Pleuro-pneumonia in that city. Among other things, he wished to know how the authorities of Glasgow dealt with the disease, and what money value they had paid in compensation for the past ten years. On being informed, he replied in writing :—" There must

be something radically wrong in our management here, when there is such an enormous difference in our expenditure compared with yours ; our net expenditure for compensation being over £4,500 per annum for the last ten years."

During the month there has been a serious outbreak of Pleuro-pneumonia in the County of Perth, and the local authorities of Perthshire and Glasgow having placed the matter in my hands for investigation, I have had another opportunity of observing how the Act is wrought in some parts of Ireland, and I know it is very much the same all the country over. The cattle in the outbreak referred to came from County Meath, and with the willing and able assistance of the officials at Dublin Castle, I had no difficulty in tracing them from the commencement of their journey in Ireland till they arrived at their destination in Perthshire. The animals, forty in number, were bought up promiscuously in Ireland by a dealer in cattle, and placed by him on a grazing farm in the Union of Kells. Shortly after being placed in the fields, one of the herd developed Pleuro-pneumonia, and was killed. The outbreak was duly reported by the inspector of the district to the local authority, and by them to the Irish Privy Council, and the farm became an infected place for fifty-six days. On the expiry of the fifty-six days, the restrictions, on the recommendation of the local authority, were removed, and the forty cattle were brought up to Dublin, shipped to Glasgow, and thence railed to Perth. Seven days after the arrival of the cattle at their destination one animal showed symptoms of Lung Disease, and was slaughtered ; and in other eight days several other animals were also affected. Such is the brief history of this outbreak ; and, although a prosecution for breach of the provisions of the Act cannot be instituted against the dealer, seeing that he did not remove the cattle from Ireland to Scotland until he had obtained permission, still some person or persons are to blame, and these persons, in my opinion, are the local authority of Kells. They are responsible for working the Act, and how have they done it? They have appointed as inspector under the Act a man who knows nothing of the duties and the grave responsibilities he has undertaken ; as witness his answers to the following questions :—"How do you know when a bullock is affected with Pleuro-pneumonia?" "Ach, sure, whenever you go into the field, he is the first beast to catch your eye, and he just keeps watching you till you go out." "Do you use the thermometer in making an examination of the animal?" "Sometimes I does." "Just read how this thermometer stands. What does the index register?" "Well, sure, can't say I understands it." "Where would you place the thermometer?" "Under the tail in the cow." "And where in the bull?" "Under the arm." "What is the natural temperature of the cow in the rectum or vagina?" "98°." "What difference would you expect to find in the temperature under the arm and within the rectum?" "30° of difference."

The natural temperature of the ox within the rectum is not 98°, but from 101° to 102°, and the rectum or vagina are the only situations to be relied on in using the instrument in veterinary practice.

The Act requires that for fifty-six days after the date of the slaughter of the last affected animal a weekly return be furnished to the Privy Council as to the condition of the remaining animals of the herd. To comply with this request, the inspector should make a personal and minute inspection of each animal composing the herd every seventh day, but this inspector being only paid for a single inspection in each outbreak of disease, made no weekly inspection in any case ; but on the expiry of the fifty-six days, to use his own words, "Just looked in to see how the animals were, as he was passing." Had the animals been subjected to a rigid inspection, the chest auscultated and percussed, the pulse taken, and the temperature registered, undoubtedly some of the cattle would have

been found in an unhealthy condition ; and, knowing that Pleuro-pneumonia had existed in the herd, it became the imperative duty of the inspector to have so acted before he let loose the herd on the public.

Now the want of veterinary knowledge displayed by the inspector is not exceptional—it is the rule ; because the greater number of the inspectors in Ireland under the Act are non-professional men, and have never had an opportunity of studying veterinary science. Every Poor-Law Union in Ireland is a local authority under the Act, and there may be a dozen local authorities in a single county. You can thus perceive how very difficult it is to work the Act under such circumstances ; but, in truth, it is a dead letter in most places in Ireland, and it will continue to be so until the Irish Act is assimilated to that of Scotland, in so far as the appointment of local authorities is concerned, and until there is at least one qualified veterinary inspector appointed to each county and burgh. Last year, as many of you are aware, I spent several weeks in Ireland assisting to draw cordons, and making other regulations for stamping out Foot-and-Mouth Disease ; and unless these regulations had been made, and the local authorities of Scotland had closed against the receipt of Irish cattle (until these regulations were made), the disease would have been allowed to go on spreading. So supine are the Irish local authorities, and so unwilling to interfere in the least with the transit of cattle—be they diseased or not—that I am afraid, unless the local authorities in Scotland and England again put the thumbscrew on our Irish friends, we will have frequent importations of Pleuro-pneumonia from that country.

Inspections, however carefully conducted, or, I should say, as carefully conducted at the ports of embarkation and debarkation *as circumstances will permit*, cannot protect us from Pleuro-pneumonia in the stage of incubation ; such being the fact, and the inspections under the local authorities in Ireland, as at present conducted, being so utterly valueless and misleading, the Irish Privy Council ought to be memorialized to deal with the subject at once.

And now, in conclusion, permit me to offer a few words of advice to those students who for the first time have taken their seats on these benches. Varied, indeed, must be the feelings and thoughts which possess your minds, and to me they are, of course, unknown ; yet, having passed through the same ordeal, and remaining in much still a student, although called a teacher, I fancy that I can read and understand many of your aspirations and some of your disturbing doubts. Time will not permit me to do more than glance at a thought or two which, if not uppermost in the minds of all, will be in those of many placed as you are on the threshold of your studies. What have I to do? How shall I succeed in doing it? And how much I do wish success may crown my labours? These and other such like questions, I know, will find an echo in the bosom of every earnest student now present. All of you, no doubt, have formed some estimate of what you have to do, but the probability is that not one of you has fully estimated the amount of laborious study and mental anxiety you have to endure from the day you enter this College until you leave it in possession of your degree. But, gentlemen, if there be labour, there is also associated with it the pleasure of having acquired the very knowledge we, as it were, thirst for ; and if the labour be rightly gone about, we are unconscious of the greatness of the burden, and only now and again feel as if we were, in truth, overweighted.

Many of our physical, and most of our mental pleasures, as you are doubtless well aware, are the results or fruits of a long series of laborious exercises, irksome and distasteful at first, as a rule, to human nature. Accept it then as a fact, that the acquirement of mental knowledge or power, like the acquirement of physical power, is a process of gradual development, and requiring a shorter or longer period of time, according to the constitution of the individual and the previous training to which

he has been subjected. But still alike to all this is a difficult task. Believe not any one who says that the acquirement of veterinary knowledge, or, for that part of it, any form of knowledge, is easy or intuitive, or that it was so in his case ; no such thing, otherwise what he has acquired is of flimsy, superficial character, and therefore more likely to mislead than lead up to right conclusions.

Would you believe any one if he were so foolish as to assert that when a child *you* had no difficulty in acquiring the physical power which enabled you to stand, and thereafter to walk? I am sure you would not. In the same way, and almost to the same extent, I think we may say that we are all in the beginning as mentally helpless as we are physically powerless. It is not much, you would say, to be possessed of the physical power to stand ; yet perceive how long, how frequently, how persistently the child fights to gain that command over his body, which will enable him to accomplish the feat, and to what a feeble extent has he at first been successful. And permit me to say that it is only by imitating the child, and his frequent and ceaseless attempts in gaining a physical power, that you will succeed in becoming possessed of that mental power which must be yours, if you are to be successful students of veterinary medicine, and worthy of success. Knowing this, then, it is for you earnestly and sedulously to prosecute your studies ; and as much—very much—is demanded of you at the termination of each session, my earnest advice is—lose not a day in buckling on your armour for the battle which must be fought and won before victory is yours. Like the soldier on the march to the distant battlefield, you will find mental obstacles surrounding you on all sides ; wearied and distressed, and in the belief that you are making no progress, not a few of you will feel strongly inclined to lay down your arms and quit the service, convinced that you are not mentally equipped for the fight. But nobly have many, possessed of such feelings and forebodings, been fighting, and the timidity thus expressed is the true martial spirit which leads to victory. Afraid of failure is, I think, about the surest guarantee of success.

The student who is continually calling in question his own knowledge, and the ability he possesses of acquiring more (not as some do, calling in question the ability of the teacher who imparts it), has entered on, and is pursuing, his scientific journey—however ignorant he may be of his destination—possessed of the spirit which leads to the acquirement of any and all knowledge. In the spirit I have thus crudely portrayed, I now advise our junior students to take arms in the service of their adopted profession, and to do so this very hour.

Gentlemen, I have read somewhere—and probably so have you—that the first impression may or may not be the most truthful, but that, without doubt, it is the most impressive and lasting ; and having a strong belief in the aphorism, I am exceedingly anxious that you rise from these benches with the decided impression that you have been listening to one whose enthusiasm for his profession is only different from your own in this, that it is that of an old student, and yours is that of a young one ; that his soul is in his work, that it goes out to the youngest student as to the oldest, and that if you do your duty you have each in me a friend as well as a guide and instructor. Should this be the impression you have this day formed of me and my work, then right glad am I that I have been privileged to make your acquaintance, and no doubt our future meetings will be attended with mutual benefits.

With your previous history some of your parents have made me so far acquainted, and I can observe that not a few of them have left me, believing that they have placed in my charge all that is upright, innocent, and manly ; and, gentlemen, I hope that they are correct in the high estimate which they

have formed of their sons. Along with them, I pray that it may please God to send you back to them in health and innocence; and with this desire I earnestly beseech of you to guard your hearts against the temptations to sin so numerous in this large city. Do not idle your time promenading the streets, or those so-called places of amusement; and do keep the hours and the customs you have been taught to keep and respect under your father's roof. Be punctual, diligent, and persevering in the discharge of every duty; and remember that, while I am responsible for order and regularity in every department within the College, I have no authority beyond it, and to you is entrusted its fame as an educational institution. Strive, then, to maintain your position in life; be earnest, honourable, and straightforward; cultivate habits of sobriety and truth; cherish respect for yourselves in all places, at all times; and do not forget your duty to your college confrères—your obligations to your fellow-men—

What matter tho' at different times,
Our fathers won the sod;
What matter tho' at different shrines
We kneel before one God;
In fortune and in fame we're bound,
In stronger links than steel,
And neither can be safe nor sound
But in the other's weal.

DR. RUSSELL said:—Gentlemen, I had very great pleasure in taking the chair on the present occasion. Your Principal is a personal friend of my own. We are fellow-servants of the public, and the subjects to which we have devoted our lives are very intimately related. I have listened, as you all have, to this introductory lecture with very great interest; so much so, that it is only on looking at my watch that I discover the time has so far passed that it will not be proper to trespass upon your patience with any detailed remarks. As to the first part of the Principal's address, I do not feel myself competent to enter or pass an opinion upon; but it is quite evident to me that the questions which disturb the medical profession, as to the examinations and courses of study, are exactly similar to those questions which disturb your minds. And criticising the opinions expressed by your Principal in the light of common sense, they certainly appeal to me as being just; and I could observe by your frequent applause that they were certainly popular with you. (Applause.) The other portion of the Principal's lecture is one on which I can speak better, and the results of the administration of the Contagious Diseases (Animals) Act in the City of Glasgow are certainly extremely gratifying, and ought to go far to justify a perseverance in the same course which has led to such excellent results. I observe that the Principal, with his natural modesty, spoke of these results having been achieved by the local authority; but I, as a citizen of Glasgow, and a close observer of the operations carried out by the Local Authority under the Contagious Diseases (Animals) Act in Glasgow, am free to say that it would be no excess of fact to attribute the excellence of this result almost entirely to the Principal himself. (Applause.) I cannot forget that Principal M'Call does not confine the execution of his duties under this Act altogether as if he were consulting his own ease and comfort. He requires the enthusiastic support of the public, and an appreciation of his services, in order to sustain him in meeting and overcoming any pertinacious obstruction, and even virulent criticism, which a faithful servant will very often meet with from those upon whose privileges he is trespassing. I think the least thing we can do is to give a very hearty vote of thanks to the Principal for his address. (Loud applause.)

ROYAL (DICK'S) VETERINARY COLLEGE, EDINBURGH.

Opening of the Session.

THE introductory lecture to the winter session at this institution was delivered on Wednesday, the 29th October, by Dr. James. There was a good attendance of students. Bailie Hall, in the unavoidable absence of the Lord Provost, presided, and there were also present—Councillors Drybrough, Macdougald, M'Intosh, and Robertson; Colonel Gillon, of Wallhouse; the Town Clerk (Mr. Skinner); Deputy Town Clerk (Mr. Harris); City Chamberlain (Mr. Adam); Dr. Ferguson, Edinburgh Institution; Dr. Imlach, late President of the College of Surgeons; Dr. Gibb; and the following veterinary surgeons—Messrs. Rutherford, Edinburgh; Aitken, sen., Edinburgh; Borthwick, Kirkliston; Thompson, A.V.D., Scots Greys; Galloway, Perth; Calvert, Middleham; Prentice, Veterinary Department, Privy Council, Ireland, etc.

The CHAIRMAN, in the course of some introductory remarks, spoke of the College as second to none in the kingdom, and expressed his conviction that so long as it possessed such a staff as the present they need not fear for its future success.

Dr. JAMES then delivered the following address:—

Mr. Chairman and Gentlemen,—In addressing you for the first time at the commencement of another year, my first duty is as plain as it is pleasant. It is simply to offer you all a hearty welcome to our College. To those of you who have already done work within its walls I will express the hope that you return refreshed and invigorated for further study. To those of you who are here for the first time I would, with the same good wishes, offer my congratulations on your having determined to follow the profession of medicine. Our profession is one which is excelled by no other in directly furthering the wellbeing and happiness of the community, and it is peculiarly alone in that it affords material of a nature especially likely to enlarge the intellect, broaden the sympathies, and elevate all who enter upon its study. Our profession is not one which is likely to be chosen by those whose ambition in life is the attainment of public renown or the amassing of great wealth; but it is certainly one which will afford something far better, viz., happiness, and one which teaches us philosophically to put at their proper value such objects of ambition as titles, renown, and great wealth, at the same time enabling us, if we conscientiously use the energies which Providence has given us, to obtain as much as is good for us to desire of each. Let me therefore again offer my congratulations to those of you who begin medical study, with the surety that, as years roll over your heads, your appreciation of it will ever tend to rise.

But now, gentlemen, it is usual for one of your teachers who has the honour of giving the inaugural address to discuss with you some topic of interest. I propose now to do this, but I must, in the first place, confess that I have had some difficulty in finding for this a suitable subject. This is not from any lack of such; our profession always presents enough of interesting and instructive material, but it is due to the fact that, as it is my bounden duty to make myself comprehensible to you all, I must endeavour to select some topic which those of you who are just beginning in the profession are able to understand. Just as the speed of a fleet is regulated by that of the slowest vessels composing it, so must I confine my remarks within the limits of comprehension of those who are as yet practically ignorant of medical knowledge. My choice is therefore somewhat limited. Let me, however, do my best in the choice, and make a beginning.

You all know that there have existed men who are commonly and justly called the fathers of medicine. Of such men Hippocrates, Galen, Æsculapius,

etc., are examples. They lived many hundreds of years ago. They practised with success, they founded schools, and wrote works which are still regarded with respect, admiration, and even veneration. Well, now, suppose that any one of these great and good men were suddenly to revisit this world, and were desirous of again engaging in medical practice, he would, of course, have to obtain a diploma—*i.e.*, he would have to pass the examinations. Would he be likely to pass? Certainly not. He would certainly fail. And although we may not consider the Examining Boards of the present day to be perfect, we should have to allow that in this case they had acted rightly, and that the rejection was just. In order to demonstrate how the great physicians of antiquity would infallibly fail in the profession at the present day, Dr. George Balfour, in an introductory lecture which he delivered at the opening of the Edinburgh Medical School some years ago, described a supposed visit of one of them (Hippocrates) to the Edinburgh Royal Infirmary. I should like to give you this description in full, but inasmuch as were I to do so I should be taking up more of your time than is absolutely necessary, I shall merely give you a *résume.*

Dr. Balfour pictures him going up the main staircase of the infirmary into one of the wards, and there, in the presence of the physicians and students, enunciating some of his views on disease. He depicts the surprise with which he looks at certain chemical manipulations, the amazement with which he regards the resulting reactions, and the feeling of discomfiture which he experiences when he is asked which of the sugar-tests he prefers. Finally, Dr. Balfour describes the physician, after showing him a good example of the cracked-pot sound, as handing him a stethoscope to listen to a good example of broncophony. To use now Dr. Balfour's own words :—"The word has a Greek ring about it, and thinking he may understand it better with the instrument in his hand, Hippocrates takes it, and, uncertain what to do with it, looks first at it, and then through it ; considers whether he should listen to it as to the moaning of the sea in a shell, or whether the sound is to be produced by blowing through it as a trumpet, and utterly bewildered by all he has heard and seen, suddenly recollects an important engagement in Thessaly, and, with many thanks, returns the wonderful but unknown instrument, and departs a sadder if not a wiser man, fully conscious that if called upon to pass a clinical examination of to-day he, the great clinicist of antiquity, would infallibly be found wanting."

So much for progress in the infirmary. Let us, however, follow him further. Discomfited by the poor appearance which he has made here, but unwilling altogether to confess himself beaten, let us suppose that he determines to find out if he cannot make a better appearance in another establishment, and let us suppose that he pays us a visit in the Royal Dick Veterinary College. He had studied diseases among animals, and he is conscious that the treatise which he wrote on equine disorders is known at the present day. He comes to us here, therefore, trusting to do better. He is, of course, courteously received. He is shown through the dissecting-room and museums, where, as comparatively few words have to be exchanged between him and his hosts, he begins to feel again somewhat at ease. It is only for a moment, however. On a table are displayed an array of microscopes, and although he previously had been afraid of exposing his ignorance by examining them, his curiosity now gets the better of his discretion, and, following the example of his hosts, he looks through them. Here he is again dumbfounded ; a section of bone, with its lacunæ and canaliculi, appears to him like nothing else than an army of spiders, a drop of blood more like a lot of peas than anything else he knows of ; and when he views the magnified head of the cysticercus, with its suckers and double row of hooks, he starts back in fear of bodily harm.

Politely appearing not to have observed his expression of amazement and trepidation, we begin to ask him a few questions, and the microscope being present in our minds, our questions are made in connection with them. We ask him if he is in the habit of using the immersion lens, or what staining fluid he prefers to demonstrate the bacillus of tubercle? To such questions he, as formerly, has recourse to feigning a little deafness; and when we further endeavour to discover his views on Chicken Cholera, or on the attenuation of the virus of Hydrophobia, he quite collapses. He again recollects his important engagement in Greece, and hurries off, more than ever conscious that for him to attempt to pass through the portals of the profession to-day would be the courting of a decisive and ignominious defeat. But now let us follow him still further. We will suppose the utterly bewildered old gentleman, in order to avoid the public gaze, slowly wending his way along Clyde Street. So confounded is he at what he has seen and heard, that he at first cannot even think. By the time, however, that he has reached Elder Street, he is so far recovered that he is able to meditate, and as he slowly paces along Swinton Row he begins to realise the tremendous advances which medical science has made in this globe since he was one of its inhabitants. "Why," cogitates he, "physicians must nowadays be able to cure every disease; pain and suffering must be at an end in the world, and, of course, death in men and animals must be a most infrequent occurrence." But just at this moment he emerges into the somewhat open piece of ground at the east end of Swinton Row, and he is brought to a sudden stop; for an array of sombre-looking vehicles, drawn by as sombre-looking specimens of the equine race, meets his gaze. Instinct tells him what this means, that he has come upon an establishment, the function of which is the due disposal of the dead. "So, so!" he thinks to himself, "people must still die;" and as he discovers the large number of the vehicles, "they must die, too, in quantities." Moreover, that "doctors can't prevent them dying at inconvenient hours," is what he concludes, as he sees the words, "Night-bell," written conspicuously on a sign-board. A grim smile now crosses his countenance, and he determines, before going back to Greece, that he will make some inquiries as to the mortality of the present day. What he finds out certainly surprises him. He learns from the books and periodicals that the mortality apparently has not diminished, for probably in the same column of a daily paper he learns that in one part of world hundreds of human beings are dying of Cholera, and in another hundreds of cattle have had to be slaughtered for disease. He discovers, also, that scientific opinion as to the causation of disease is anything but settled. On the one hand, he finds certain scientific men upholding the view that the bacillus is the sole cause of Tubercular Disease, and on the other, equally credible witnesses testifying that it is almost absolutely guiltless of producing such dire results. In the medical journal of one week he finds that the fountain and origin of Cholera, the comma bacillus, has been detected by the observer, and in that of the next he finds that another distinguished observer, in order to put the matter right, has had a dish of comma bacillus for breakfast and is not a bit the worse. He cannot but admire the cool intrepidity in the cause of science of such an individual and of those who have declared themselves willing to test upon themselves the efficacy of the inoculation of the attenuated virus of Rabies; but all this he considers simply shows that our advance in the healing art is more apparent than real, and that though he is ignorant of the scientific appliances of the present day, yet his practical work—*i.e.*, the curing of disease—was about as far advanced twenty-three years ago as it is now.

Now, gentlemen, these are the questions which I wished to illustrate. They are ones which you will often hear stated, which you will feel bound to criticise, and ones which at the beginning of your medical studies may appro-

priately be considered. They are (1) that medical science has made tremendous progress since the time of the so-called fathers of medicine, and yet (2) it has really been asserted that the practice of to-day has made no corresponding advance.

Let us consider the first question first. How is it that the old physicians were so ignorant of the phenomena of disease? It was simply because they were almost entirely ignorant of the properties and functions of the body in health. But you will again ask, Why was their acquaintance with the functions and properties of the body so slight? It was not because they were deficient in brain-power. As far as this is concerned, it is acknowledged that they were in no way our inferiors, and in sculpture, poetry, and philosophy they have given abundant evidence of this. How then was it? The answer is that they were almost absolutely devoid of the physical means necessary for investigation. They could examine the outside of a patient during life and the inside after death, but all the information gained was merely that which could be obtained by the unaided senses. How different from now. By our knowledge of optics we can construct instruments which enable us to see clearly objects hundreds and thousands of times too minute for the naked eye. By chemistry we have means of testing the composition of bodies, infinitely more delicate than the old physicians ever dreamed of, and our knowledge of heat, light, and electricity gives us an insight into the functions of the body which is as clear as that of the fathers of medicine was the reverse.

Thus, then, for our more thorough acquaintance with the properties and functions of the body, we are indebted to the sciences—physics, chemistry, etc.; and if we could at present enter into this subject more fully, we should find that, as our acquaintance with the latter has increased, our knowledge of the former has correspondingly advanced.

But now let us see what can be said to the second question. Has the practical aspect of the profession made corresponding progress? This can be simply answered. In the year 1530 the average longevity was 21·21 years, whilst between 1814 and 1833 it was 40·68 years, *i.e.*, as large a number of people now live to seventy years as lived to forty years 300 years ago. Now, this means progress, not only in relation to man, but in all that concerns humanity; it means a corresponding advance in our knowledge of how best to deal with all those creatures upon which the welfare of man is so intimately dependent.

And now, gentlemen, that we understand that medical science has advanced, and that *pari passu* with this advance there has been a gradual amelioration in the condition of humanity, are there any practical deductions to be drawn from these considerations? There are, indeed, many; but perhaps the chief of these is that, inasmuch as we succeed to an inheritance of scientific knowledge, precious to us as being a great source of the health and happiness we enjoy, it is our bounden duty so to use our energies as to make full use of that knowledge, and also so to act as to transmit it improved to those who succeed us. We should remember that the fact of our being placed in circumstances in every way immensely superior to those which our forefathers occupied, whilst it increases our comforts, increases also our responsibilities. We work, as it were, upon capital which has gradually accumulated as the result of hundreds of years of patient labour, and we must not be content with simply gathering in the interest, but remember that it is our simple duty to do as we have been done by.

It is to us all a matter of the most sincere gratification that we have only to look around to discover that we are still associated with men who have well borne the trust which they inherited. Of this the College in which we now stand is a noble example. It is an institution which owes its origin to no act of Royal favour, to no enactment of a commission appointed by Par-

liament, but to the honest work and unflagging energy of one who did his duty to his fellows, who, recognising that science must be progressive, endeavoured so to act as to render it better in the world when he left than when he entered it. He was one who had a real influence on his fellows ; he could comprehend what the times required of them and put them in action. As a representative of the period in which he lived he was the *best;* he was essentially a great man.

Moreover, in connection with the debt which medical science owes to William Dick, there is another aspect to which I wish for a few moments to advert. In this age, in which the subject of education is occupying such a prominent position—in which it is regarded as the panacea for all the ills that flesh is heir to—we are, of course, fully alive to the value of establishments endowed for the purpose of conferring its benefits. But we are, I think, rather inclined to be oblivious of the fact that educational institutions themselves require to be educated. There is no doubt that where a number of men are set apart from their fellows to impart instruction in several branches, there becomes developed in them a tendency to insist too much upon the value of special knowledge. The professors and teachers in such institutions are, of course, appointed for special subjects, and it is well that this should be so ; but this, like everything else in this imperfect world of ours, has the drawback in that it is apt to lead them to look at everything through too narrow an aperture. They know that there are certain grooves along which minds have to be trained to run ; they are apt to make the grooves so deep that they can see nothing on either side. On this point Comte says, "The specialising system is apt to result in a sort of academic idiotcy ;" and again, "The academic system narrows the mind and blights the imagination, but its tendency to dwarf the sympathies and degrade the character is still more certain." This is very strong language, but though we need not go so far as Comte has done, we must acknowledge that there is in it a certain amount of truth. Now, I think we must congratulate ourselves with the issues, that in our College this danger is reduced to a minimum, and for this again we have to thank the consideration and foresight of William Dick. Through our organic connection with the Town Council of Edinburgh, we may rest assured that the work done by our College will advance with the times. We know that the work is being jealously regarded by men who recognise that science must be progressive, and whose training and occupations tend to enable them to view the interests of the College from a wider standpoint than that occupied by those who labour solely within its walls. With a perfect understanding between the College and the Council, we, in the former, need have fear neither for the College nor for science in the future ; and I have no hesitation in stating my conviction that it would be better for medical science in this city if this influence of its Town Council could be further extended.

Whilst on the subject of medical education, there is another matter which I think should be mentioned, as it intimately concerns all of us. You know that the Royal College of Veterinary Surgeons makes it a rule that no teacher should be an examiner. That this is a wise rule, in that it obviates the risk of a teacher examining his own pupils, we must all express our unqualified satisfaction. But it has the drawback in that it cuts out entirely from the Examining Board men who are best qualified to examine, men whose business it is to keep ahead of science, to know what students should know, and to detect in what they lack. Of course, it is easier to point out a fault than to procure a remedy ; but with this modified, and with written exercises, we should have equality as nearly as it can be got.

In conclusion, gentlemen, you are entitled to expect that I should offer you some words of practical advice. Well, on this I shall be brief.

First, as regards your conduct to yourselves and to your fellows, I say absolutely nothing, as this is a matter for personal influence, and cannot be imparted by words. You all know the saying, "Example is better than precept." I should almost be inclined to say precept had better be left out altogether; for precept with example is useless, and precept without example is ten thousand times worse than useless. I, therefore, let this alone.

There are, however, some points connected with your every-day life in which one who has passed through the mill may be able to offer counsel.

In the first place, let me advise you all to be methodical. Have regular hours for work, and regular hours for rest. I do not say have long hours for work; with regular hours you are far more likely to succeed.

Secondly, as students, work up each subject equally. You will, doubtless, often find one more captivating than another, and will, therefore, be inclined to devote attention to it, to the neglect of the rest; or you may find a subject so devoid of interest that you would rather avoid it altogether. Avoid this. You will have plenty of time to specialise by-and-by.

Lastly, take care of your health. Remember that without it little or nothing can be done. He who neglects his health may, as Johnson puts it, be justly represented, not only as a spendthrift of his own happiness, but as a robber of the public. Let your motto be "*Mens sana in corpore sano*," and you can look upon the future with confidence.

On the motion of the CHAIRMAN, a hearty vote of thanks was accorded to Dr. James for his address.

Principal WALLEY then made a few remarks in reference to the connection which existed between the College, the Town Council of Edinburgh, and the Highland Society of Scotland. He said that he was very sorry to see, some time ago, a statement made at one of the veterinary medical associations, by a gentleman who had been placed in a position on the Examining Board of the Royal College of Veterinary Surgeons, which called in question the right of the municipal bodies of Edinburgh and Glasgow, as also the Highland Society, to interfere with any action the Royal College of Veterinary Surgeons might see fit to take in connection with veterinary education. It would, he thought, have been quite as well if this gentleman referred to had taken a little trouble to make himself acquainted with the history of the connection of these three influential bodies with the profession before giving utterance to such remarks. In reference to the Edinburgh Corporation, it was a matter of common notoriety that there existed between them and this school the closest possible connection, seeing that they were the trustees under the late Professor Dick's will, that Professor Dick himself had been during his life a member of the Town Council, and that that body had always taken a deep interest in the advancement and welfare, not only of the veterinary and medical professions, but of all professions and sciences which were of use to the world at large. The Glasgow Corporation had showed the same desire to assist the profession, and had also exhibited an earnest desire for the advancement of education generally. As to the Highland Society, its connection with educational matters dated back exactly one hundred years, at which time it was established, not as an agricultural, but as an educational body, and for the purpose of improving the condition of the inhabitants of the Scottish Highlands in particular. Some years elapsed before it took up the position of an agricultural body, and it was not until 1831 that its showed its regard for the veterinary profession, when it assisted Professor Dick to place the profession in an honourable position in this country, and since that time it had done more to encourage veterinary science than any other body in the United Kingdom, and even now it extended the hand of encouragement to the veterinary students of this country. Surely these facts were sufficient to

establish the right of the three bodies mentioned to keep a jealous and watchful eye upon the doings of the Royal College of Veterinary Surgeons, and to come forward when they thought that matters were being carried too far, and utter a word of protest. When they took into consideration the extent of the curriculum and the large expenditure required in order to obtain the diploma, they would see that it would be a great hardship to increase the burdens put upon students, and to further handicap the good men who came forward from districts in which their brethren were perforce content to live in huts such as a lowland cotter would despise, and who could never expect to make anything more than a miserable pittance (often inferior to the pay of a third-rate clerk) by the practice of the profession.

The PRINCIPAL then went on to say, in regard to the action of the Royal College of Veterinary Surgeons, that when up till last year there were only two representatives of Scotland in the Council of that College, and at present only one man residing in Scotland who was a member of the Examining Board, he thought it was pretty plain that justice had scarcely been done to Scotland in this respect. An attempt had been made—and so far had been partially successful—to remedy this state of things. During the last year not only had Professor Williams and himself occupied positions on the Council, but Professor M'Call, of Glasgow, had been added, and he was proud to say their friend, Mr. John Borthwick, had been put on as Vice-President. More than that, the other day a resolution was passed by the Council of the Royal College that the Examining Board should be enlarged, and he was happy to tell them that Mr. Borthwick was chosen as an examiner. (Applause.) Another item of news was that a syllabus was to be drawn up by the examiners, so that students should know what they were going to be examined upon at each table. (Applause.) They had also got a slight alteration in the students' marks, which would perhaps assist them a little. As to the accommodation of the Royal College, it had in the past occupied an ordinary dwelling-house ; but at the last meeting of the Council it was agreed to erect a building. The site was purchased, a good deal of the necessary money obtained, and he hoped before long there would be a Royal College of Veterinary Surgeons worthy of the profession. (Applause.)

Colonel GILLON said he was delighted to see so many students present, and when he looked back to the time, now thirty-seven years ago, when he first remembered the College, he saw a great improvement, not only in the numbers, but in the condition and the appearance of students. (Applause.) An effort was made some years ago, with the aid of the Duke of Buccleuch, to get a Veterinary College for Scotland alone, separate from London. Whether many agreed with him in that he knew not, but the Highland Society made that determined effort, and if they were backed up, he thought they would make another. (Applause.)

On the motion of Councillor DRYBROUGH, a vote of thanks was tendered to Principal Walley and the other professors ; and with similar compliments to the Chairman, proposed to Dr. AITKEN, and to the strangers, by Principal WALLEY, the proceedings terminated.

NEW VETERINARY COLLEGE, EDINBURGH.

THE session of this school commenced on October 22nd, and there were present—Messrs. Connochie, V.S., Selkirk; Aitken, V.S., Dalkeith; Thomson, A.V.D., Piershill Barracks ; R. Rutherford, V.S., Edinburgh ; Baird, V.S., Royal Veterinary College, Edinburgh; Brock, V.S., Glasgow; Borthwick, V.S., Kirkliston; Chalmers, V.S.; Fenton, A.V.D.; Hodgkins, V.S.; Woodhead, M.D.; Faulkner, V.S., Manchester ; Reid, V.S., Leith ; Durkie, V.S., Dundee, etc.

Principal Williams was in the chair, and the introductory address was

delivered by W. I. Macadam, Professor of Chemistry and Toxicology. It was as follows :—

Principal Williams, Ladies and Gentlemen,—It is not without considerable misgiving that I trust myself to deliver the Inaugural Address of this the second year of our meeting in these College buildings.

As you are well aware—and your presence here denotes the fact that you are aware—the New Veterinary College of Edinburgh, one of two colleges in our city, and one of the three Scotch Schools of Veterinary Medicine, owes its origin to the indomitable pluck (I can use no other word) and honest hard work of our Principal, Professor Williams. It is useless for me, gentlemen, to waste your time in vainly attempting to recount the various battles he has had to wage before the magnificent pile of buildings in which you now study was reared ; suffice it to say, that these walls and these rooms are a fitting monument to their author, and well I know he desires no better.

In a word then, I, in the name of the Principal and professors of the New Veterinary College of Edinburgh, welcome you to your studies, and assure you that previous success will in no wise loosen the bonds of our labour, but rather stimulate to things still greater.

To those amongst you who return after a brief breathing space to your books, we wish all good luck in the coming session. It is for you to show the way to your younger brethren, and by your hard work and close attention to duty, to assure yourselves the successes in store for you at the examination tables.

To those who appear on these benches for the first time, I extend the hand of welcome. You have done well in choosing such a profession, the most noble of all professions, the profession of healing. Do not be led away by the idea, too often entertained, that it is possible to play during the session, and have recourse afterwards to "grinding." Such knowledge is shallow and worthless. Pass your examinations you may, but the after-result, in which the public is the jury, will show the honest hard worker far aloft, and pulling hard up the ladder of fame and fortune, and the "grinder" painfully losing his feet amongst the lower rungs. In a word, then, success depends on honest hard work.

The subject in your professional training which I personally represent, namely, chemistry, coupled with the detection of poisons, or toxicology, is usually looked upon by the student as an "extra" subject necessary for the first examination, and not unfrequently treated as such only. Now, is this the case? Does not a thorough knowledge of chemistry aid the student in his other subjects? Is not chemistry—pardon me if I claim too much—the foundation on which your other subjects are reared—a pure science built on lines fixed and firm, a science which starts with simple and, at present at least, indivisible portions of matter termed elements, and with laws by means of which more and more complex bodies are built up, until substances are formed which not unfrequently are found to be equal in all respects to those produced by living matter—a science which, starting with elementary bodies, only stops short and fails when called upon to produce organised living matter, or life itself? A knowledge of chemistry then, I maintain, is the very best foundation on which to build your other studies, and on that account is properly placed amongst those subjects with which you are called upon to show your acquaintance before passing to medicine and surgery.

In the very short time placed at the disposal of the science, it is impossible to master more than the framework or bones of the subject, and necessarily such elementary knowledge should form the essence of the professional examination. In entering on this aspect of the subject I do so with all respect to the powers that be, to the Council of the Royal College of Veterinary Surgeons, and to their painstaking and efficient staff of examiners,

and to none greater respect and personal goodwill than to the examiner on my own subject.

As you are all aware, the subject of examinations is possibly one of the most burning at present before the profession. The attention of all has been directed to the subject by the results of last season's "final" examinations, during which a much larger proportion of the candidates failed than had ever before been the case. Now, what was this due to? Was it to less careful and efficient tuition in the schools, or is it the fault of the examiner, or are the tests pitched so high that the average student cannot come up to their requirements? First, then, is it the fault of the teacher? In answering this question we will require to look at the results of the examinations, not of men, but of schools. Now, in the four colleges in Great Britain the same rule applies, namely, that the proportion of failures last season was greater than in previous years. This, then, does not look as if the teacher was to blame. As for the students, I can safely say that they are at least equal to the candidates for medical and other science degrees, and that the results of the class examinations held during past sessions will compare most favourably with those of the medical classes. The student is, therefore, not below the average of young men intellectually.

Now, in studying the subject from the various lights in which it is presented in the journals devoted to veterinary medicine, I find it stated on high authority that it is due to the most laudable desire on the part of the Royal College to make the requirements more stringent, and, therefore, the diploma more valuable. In this we as teachers shall in all ways aid. But is there not a possibility of rendering the standard too high, of demanding too intimate a knowledge of a science, or of its applications to other sciences, or branches of the same science? Take chemistry—fluorine is one of the elementary or simple bodies; it is a substance with such energetic properties that chemists have no certain knowledge that it has ever been isolated. It is presumed to be a gaseous body with corrosive action on glass or other siliceous compounds, and forms certain salts with the metals, one of which, the calcium fluoride, is present in bone. The teacher might lecture for some days on the subject, but would require to summarise all at the close by saying that the body was one of which we knew very little certainly, although a good deal might safely be deduced as to the properties, etc. Under the present system this element may crop up from time to time. The alkaloids are a class of complex organic bodies comprising many of our most powerful drugs and poisons. They are a large class, but comparatively few are important. Whilst strychnine, morphine, quinine, etc., may fairly be considered, other and more rare members of the series should not be examined upon.

These illustrations will go a long way to prove that the tendency of the examinations is to demand too high a standard of proficiency, too extensive a knowledge of each particular science—in fact, to demand from the student what is not called for in the examiner, a knowledge almost perfect in all his subjects. I am well aware that the particular examination to which my science belongs is not a "deadly" one. Still we know that what appears in the first examination is to a still greater extent present in the second, and is almost fatal in the final. Now, how is this difficulty to be overcome? How is the student to be brought up to the present high requirements of the Royal College of Veterinary Surgeons? The question seems a hopeless one so long as the subjects remain so wide. Last session I drafted a letter to the Royal College, in which I proposed the publication of a syllabus in which would be detailed the points considered to be of greatest importance to the profession. This letter has not as yet been forwarded, as I am desirous of carrying with me the whole body of examiners and teachers, or at least a large proportion of such. Those of the examiners and professors who have seen it have agreed

with its contents, and will support what it suggests. I am not altogether without hope that the scheme may bear fruit, and I feel confident that the result will show not only a larger number of "passes," but a more intelligent grasp of the subject by the students. The idea is no new one; it is an accomplished fact with the medical licensing boards of the country, and is bound to work well. At present a student, so far as the actual law goes, may be examined on the constitution of the most complex organic bodies, or the analysis of a simple salt. With a defined syllabus the teacher requires to bring his men to a certain point. At present we know not where we may be taken. In fact, as the subjects now stand, the teaching body are required to watch the peculiarities of the examiner, instead of following a steadfast, I might almost say, honest course of study.

Now, a good deal has been said as to the "Scotch" colleges, and a good many threats have been made on both sides, but we must remember that what we work for is not only the benefit of our College, but the improvement of the profession. Can such be accomplished by either party separately? I doubt it, believing as I do that the interests of the colleges are bound up in the well-being of the Royal College. Can such well-being be promoted by such a declaration as that reported in a late number of a veterinary journal to have been made by a member of the Examining Board, that "half of the students that come up for examination should be rejected, and the other half kicked out of the profession"? Is this true? Are our men so inferior that they either do not deserve to pass, or should receive such summary treatment as this examiner suggests? We, the teachers who know you, who personally come in contact with you, and who watch your daily progress—answer for you, and declare the statement unsound in fact, and unsupported by evidence.

But grant the statement true, you have here an examiner who, on his own word, has regularly allowed men to pass who should either have been "rejected" or "kicked out." Is not this a somewhat strong argument for the theory that reform is needed elsewhere than with the students? No wonder that so many of our promising men are found amongst the "duffers" and "chronics" in the rejected list, if this is the belief with which our examiners are to receive them. But, gentlemen, we know that whatever the statement of this particular examiner, it is not supported by his colleagues. They may come with ideas of perfection or standards fixed for them, but they come to carry out their work honestly and fairly. No one can enter the examination room without being convinced of this fact.

I have taken up already too much of your time, and must leave the discussion of other and as interesting subjects for some fitting opportunity. Amongst such subjects is the constitution of the Council of the Royal College, which might fairly be more representative of Scotland, and of the teaching staff of her colleges. Bear in mind that at present three out of four colleges are Scotch, and that, therefore, if the professors and students are to be properly represented, and if legislation on teaching is to be carried out, a greater number of the Council should be North-country men. I am not advocating a separate Charter for Scotland, believing, as I do, that if union can be maintained it is best for all that it exist; but if the present lines are continued, and the teaching staff and North-country men ignored, the time may come when the challenge contained in a late number of one of the veterinary journals shall be accepted, and a separate diploma-giving body be established north of the Tweed. The material necessary for its formation already exists, and I have no doubt that, with the experience of the past three and a half years, a more perfect system might be inaugurated than has yet existed in the past or now exists. I can only express the wish that a little more tolerance and forbearance may be shown on both sides, and the present wounds healed whilst life remains.

Your profession has improved much of late. This year the Veterinary Surgeons Act came in force, and will do much to raise your status.

Your College during the past year has increased in numbers, and a further addition is assured for the present session.

Our men, taking the tests as they are, and considered with the passes from the other colleges, have done well at the examinations.

Mr. A. J. Haslam has carried the third of the prizes given by General Sir Frederick Fitzwygram, and which are open to the students of all the colleges. The marks awarded him for his written examinations were 861, which placed him first on the list with 53 on the right side. At the practical, however, he was third on the list, being 125 marks below the first prizeman, and 60 below the second man. The total marks in both practical and written were—

1st, 1563. 2nd, 1498. 3rd, 1491.

In other words, Mr. Haslam was 72 marks below the first prizeman, and 7 below the second. I doubt not that had Haslam received the intimation of the examination sooner than he did he would have given a still better account of himself.

Again, gentlemen, I wish you good speed in the coming session, and assure you, one and all, of our best endeavours on your behalf, and ask in return your goodwill and honest hard work. With such a combination we need fear neither work nor examination, and will most certainly leave at the close of our session a goodly record.

MONTREAL VETERINARY COLLEGE.

THE opening lecture of the winter session of the Montreal Veterinary College was delivered on October 7th, by Dr. McEachran. The attendance was large, and the greatest interest manifested in the proceedings. The chair was occupied by Sir William Dawson. Dr. McEachran said :—

GENTLEMEN,—I need not attempt to disguise the feelings of pleasure with which I meet you this evening. When I compare this bright, intelligent assemblage of students before me with the small beginnings of eighteen years ago, I can well feel proud that I did not yield before the many discouragements which had to be surmounted. Gentlemen from the Province of Quebec, from Ontario, from different parts of the United States, from the West Indies, from England, and from distant Japan now fill our benches, so that we may infer that we are known abroad, and that the reputation of the school is such as to merit the confidence of others besides our own people. Why is this the case? Chiefly on account of two great names which honour our prospectus. Of the one, it needs no eulogium from me. Our Sovereign Lady the Queen, in acknowledgment of his great services in science and education, has but recently conferred the honour of knighthood on him. I refer to the distinguished Principal of McGill University, Sir William Dawson. The other is one not yet so well known, but like him a scientist by nature ; he, perhaps, was not born with a microscope in his hands, but at a very tender age he showed, when a student with the late Dr. Borel, an extraordinary aptitude for histological and pathological investigation ; even when a mere boy his predilection for *post-mortems* was strongly manifested. Having enjoyed the advantages of the teachings of Virchow, while a student in Germany, he was well fitted for the Chair of Institutes of Medicine in McGill University, which he has so ably filled for years. It is with no little feeling of regret that I am obliged to inform you to-night that we have in the meantime lost him. I am sure that those of you who know him feel like myself that our guide and leader is gone ; for while he belonged more particularly to the medical school, I doubt very much if his leanings were not with the veterinary branch of medical science, as

affording him better opportunities of prosecuting his researches in pathological anatomy. Well, in the meantime, he is about to leave us, and we trust he will be happy and prosperous in his new sphere ; but I would feel sorry indeed if I supposed he would not come back to us. Canada cannot afford to lose such men, and had the value of such a scientist been but known to the country, he would never have been allowed to be taken from us. Osler is the Pasteur of Canada—the pathological investigator who has stimulated medical science, and led the way to every advance in pathological research. It cannot be that the country will let him be lost to us. Do we not want him in the public employment in connection with the quarantine services, medical and veterinary, as consulting pathologist for the Dominion? It is a new position, but, nevertheless, one of the most vital importance ; and in making such an appointment Canada would be but honouring herself and taking a progressive step which would be greatly in the interests of public health.

It is usual on such occasions as this to enter somewhat in detail into explanations of the numerous studies which form the curriculum of your educational course. I hope you will excuse me to-night if I depart from that custom and, instead, try to impress you with the higher aims and objects of the profession which you are now entering as students.

The Progress of Veterinary Science.

Veterinary science is no longer the simple art of the farrier, whose knowledge consists of a few nostrums and the practice of a rude form of surgery ; it is, in fact, a science, embracing within its scope the whole of the collateral sciences which are included in the curriculum of the foremost medical colleges. For the successful prosecution of its study there is required a combination of qualities such as are not needed in any other of the scientific professions, viz., a well-cultivated mind, a studious habit, and constant application, and in addition, you require physique, courage, and tact to enable you to control your patients. It has been remarked that the tendency in the schools of the present day is to devote too much to the purely scientific, and too little to the practical application of the science. This is no doubt to a certain extent true, but it is due to the fact that the time devoted to the study by the pupil is far too limited for him to accomplish both the scientific and practical together, and it must come to it that, like the medical students, veterinary graduates must spend both time and money in visiting those hospitals where large numbers of animals are being healed, not in hurried moments between hours of study, but leisurely, and when they have nothing else to do. There is no profession that has made such progressive strides as has this one. In fifty years, from the rude art of the farrier it has risen to a science which forms no small part in the progress of nations, from the fact that it is the handmaid of agriculture, which is the backbone of national prosperity. You will thus see that you are entering on the study of a science which affords ample field for your ambition and abilities, be they what they may.

A nation becomes great in proportion to the advancement of her agriculture, especially that branch of agriculture devoted to stock-raising. The mere production of grain seldom results in making a country great or wealthy. It is a well-known fact that on this continent, at least, the live-stock of both the United States and Canada has formed a very important part of their agricultural greatness, and represents no small portion of the countries' wealth ; and it behoves every country and government to promote the veterinary science as much as possible, so that they may enjoy the full advantages it is capable of bestowing in the prevention of contagious diseases.

The lecturer then treated at some length of the result of ignoring the warning voice of the profession in England half a century ago, traced the progress of disease in the Eastern States, and its introduction in the western

parts of the United States, and pointed out the efforts made by members of the veterinary profession to arouse the American Government to a sense of the danger of the disease, and continued :—

Why Pleuro-pneumonia has Spread.

How, then, comes it that this fell plague has been allowed to make its slow but certain progress westward? Simply this—gigantic railroad enterprises have, at an enormous cost in money, covered the United States as an iron network, and in many instances the bulk of their earnings is derived from the live-stock trade ; besides, wealthy corporations are organised and net large profits from stock-yards. Any hindrance, such as quarantine regulations properly enforced would necessarily produce, was consequently opposed by such corporations, and thus the fight went on ; the carrying companies and stock-yard owners, opposing any interference with the free and untrammeled movement of stock from west to east, or from east to west, had always influence enough to override the feeble efforts made by a few stockmen—as so far no united effort has been made by the cattlemen of the west, as they have not even yet been sufficiently aroused to exert their influence in the protection of their hundreds of millions of property. But they will soon find it necessary to do so, or see themselves beggared by the results of their own too long-suffering carelessness in allowing carrying companies to sacrifice their property. It is true also that complications present themselves in applying federal regulations which are not seconded by state legislation, but true it is that when the cattlemen of the west get awakened to a sense of their danger, they will bring such influence to bear that no government can stand in opposition to their wishes.

Foot-and-Mouth Disease.

With reference to the contagious diseases—Foot-and-Mouth Diseases and Pleuro-pneumonia—Foot-and-Mouth is unimportant so long as it is confined to domestic herds, and attacks them during the summer. It will run its course usually in about fifteen days, often so mildly as to escape the attention of the owner ; but is very contagious as well as infectious, the vesicles continuing not more than four days, and the feet only being affected in some cases. Hence cattle-owners who hear so much of the dreadful Foot-and-Mouth Disease are at a loss to believe that the mild fever, the faint vesicles in the mouth, the absence of foot eruptions, can be genuine Foot-and-Mouth at all. We had several instances of such even in professional men—one at a United States quarantine station, where the inspector, even after being told that it was Foot-and-Mouth, did not believe it till it had spread from the imported stock and infected 600 outside animals ; and even at our own quarantine the same owner did not quite believe the correctness of the diagnosis till two weeks had elapsed, and he saw it spreading, and the symptoms becoming more marked, in new cases. Even a professor, himself an inspector, who visited the quarantine, was so disappointed by the mildness of the symptoms, as compared with what he supposed they should be, that he concluded that it was not Foot-and-Mouth ; and went so far as to suggest to the School of Cavalry, camped a few miles off, that they should send for the milk and use it. Then our good sense, however, prevented them, they being refused not only milk but admission to the quarantine.

The unimportant character of the disease, however, changes when we consider it as occurring on a range, where, in many cases, they have considerable travelling to do in gathering their food as well as in going to water. Affected by this disease, we can understand that they would suffer severely for want of water, and their sufferings would be aggravated should it occur in winter. Its great contagiousness, both by diet and intermediary objects, is a marked

feature of the disease. Railway cars, steamboats, cattle-yards, wharves, men's clothing, hay, halters, bags, etc., etc., are all media of communication of the disease to other herds.

The Nature of Pleuro-pneumonia.

Pleuro-pneumonia is slower in its progress and more defined in symptoms. An experienced veterinarian who wants to give a correct opinion need make no mistake in this disease, if he sees the animal living and makes an autopsy at the time of death. There is no other disease of bovine lungs exactly similar to it either in the clinical manifestations or in the *post-mortem* lesions. Its contagiousness, its progressive stages, pathognomonic symptoms, and the characteristic pathological lesions are all so well marked as to leave no excuse but ignorance for an erroneous opinion of the disease. Yet, strange to say, men occupying high positions in the profession have urged that the Lung Disease of the United States was "of a milder form than the European disease." Many even deny its existence, and one leading British veterinarian went so for as to insist that the disease as seen by him was Sporadic Pneumonia; and he had immediately several echoes on this side of the Atlantic, who sought to bring themselves into notice by ranging themselves in line with him in the sporadic theory, but, echo-like, they soon died away.

The great danger to be apprehended from these diseases arises from the subtle nature of their contagiousness. Pleuro-pneumonia, Foot-and-Mouth Disease, Hog Cholera, and Scab in sheep, are all spread through the channels of commercial communication—notably steamboats and railroad cars and yards. Unless by a prolonged quarantine or actual prohibition, it would seem to be almost impossible to prevent their spread once they gain a foothold in a country, when we consider the numerous intermediary agents of communicating the virus, through the clothing of attendants, ropes, halters, blankets, hay, bags, buckets, feeding-troughs, etc., which retain the virus for months in so active a form that, if brought in contact with healthy animals, the disease is sure to be communicated.

The Contagious Character of Disease.

Take, for instance, the outbreak of Foot-and-Mouth Disease, in February last, at Portland, Me. The imported cattle were being landed at the wharf; a farmer driving a pair of black oxen, ignorant of any danger, followed them admiringly for a couple of miles on his homeward road. Next morning he took his oxen to the forge to be shod, another pair of oxen were shod shortly after his. The result was that the black oxen sickened, and infected his other cattle; the other oxen became infected at the forge. They carried the disease home with them, and from these centres the disease spread till probably six hundred animals were affected.

Take the history of Pleuro-pneumonia in any country in which it exists, and you will find similar history of its extension. In Australia, as related by Mr. Fleming, it was introduced by means of an English cow imported into Victoria, and landed in Melbourne in 1858. When the disease was discovered among the imported cattle, steps were at once taken to eradicate it. All the cattle on the farm was paid for by public subscription and destroyed, and the farm placed in quarantine. Unfortunately, however, the quarantine was not strictly maintained, and a greedy, ignorant neighbour, who owned several teams of working bullocks, which he usually employed in carrying on the roads, seeing the good grass in the infected paddocks, put his cattle into them during the night and removed them at daybreak. His cattle soon became infected, and as he shortly afterwards sent his teams on the roads on a journey to the border of the colony, they spread the disease in all directions as they went. His other cattle mixed with his neighbours', and in this way the malady was diffused around his own farm.

The Death-rate from Disease.

The great danger from this disease is its insidiousness. Were it a rapidly-spreading, death-dealing plague like Rinderpest, it would not be so dangerous, as it would then be more liable to rouse the people and Government to united action for its effectual suppression. According to Fleming, the death-rate from Pleuro-pneumonia may be estimated at from 15 to 20, and in many instances as high as 70 per cent. In mild invasions they may only be 20 to 25 per cent., but on those of a severe character they may amount to 70, 80, or 90 per cent. In general, however, the loss from death and from animals slaughtered or disposed of on account of the disease may be estimated at about 60 per cent. This, nevertheless, does not represent all the harm wrought by the Lung Plague. What with the long duration of the malady, the slow and protracted convalescence, the consecutive disorders, perhaps permanent loss of condition, the expense of medical treatment, the non-productiveness of the animals for months, etc., all this makes Pleuro-pneumonia one of the most disastrous plagues that can affect a cattle-producing country.

The truth of this may be easily verified in the history and literature of the malady, particularly in England and Holland—two countries in which it was allowed to extend and prevail for many years before concerted action was resorted to for its suppression. In England the loss in six years amounted to a million head ; while in Holland, in 230 parishes, the yearly loss has been reckoned at 42,661. In France the disease has caused great losses in the northern departments, where there is more importation and movement of cattle, owing to the facility with which they can be fed on the residues of distilleries and sugar-refineries. According to statistics of the losses caused during seven consecutive years in 217 communes of the Department of the North, it would appear that the annual mortality in a bovine population of 280,000 was 11,200, or a total in nineteen years of 218,000 head, whose value Reynal estimated as amounting to no less than fifty-two million francs. In Australia the losses in thirteen years are estimated at about 1,404,097 head, which, if valued at 30 dols. each, would amount to 42,122,910 dols. from that disease alone.

In England, during six years ending 1860, the losses are estimated at considerably more than 1,000,000 head, or at least 60,000,000 dols., or 10,000,000 dols. per year.

Gentlemen, these are the facts and figures which elicited from Sir Richard Temple, when speaking of this great and promising country of ours, the emphatic expression—so full of meaning, so timely a warning—"For Heaven's sake try to keep out Cattle Disease." Knowing well that free from disease in our herds the agricultural progress of Canada cannot be hindered, but knowing well, too, the difficulty which will be encountered in fighting against so many insidious sources of infection, nothing but the most stringent measures and careful watching will avert the great calamity ; but that the disease can be kept out, I have not the least hesitation in affirming.

Quarantine in Canada.

Canada to-day is free from all contagious disease, thanks to the wisdom of our Government in listening to and acting on the advice of those who made a special study of the question. The establishment of the quarantine at Quebec in 1876 was the initial step in the formation of the quarantine system which has kept Canada in the proud position of being the only large cattle-producing country in the world free from disease, whose cattle can enter alive any market in the world, placing them at a premium of 20 dols. a head over any other cattle, or a million and a half dollars on the exported cattle per annum. Not this alone, but the development in stock-breeding, both in numbers and quality ; the establishment of large ranches where cattle are bred in thousands ; a general and very marked improvement in agriculture to meet

the feeding requirements; the stimulus which all this has given to immigration of the proper class of farmers to our great North-west—all confer advantages on the country which cannot be estimated: and in all this we feel justified in claiming that the veterinary profession as such has played no unimportant part in seconding the efforts of the Government in conducting and carrying out the quarantine system.

Our Live-stock Interests.

Of the importance of the live-stock interests in the commercial relations of the country, I have only to mention the fact that no less than 208,633,500 dols. are invested in live stock in Canada, that the European export trade alone amounts to over 8,000,000 dols., and that were it not for this export cattle-trade many of our principal Transatlantic freight-lines would have had to lay up half of their boats for the last few years, the effect of which on general commerce can well be imagined.

Canada is essentially a cattle country. Our grass, our water, our climate, all favour it. Let our live-stock interests suffer by any embargo which may be placed on our cattle, by relaxation of regulations or the introduction of disease, and the results would be deplorable.

Thanks to the forethought and good judgment of the Hon. John Henry Pope, Minister of Agriculture, thanks to the vigilance of our Hon. High Commissioner and the wise counsels of the veteran Premier, Sir John A. Macdonald and his Cabinet, there need be no apprehensions as to the continuance of such regulations, from one end of the Dominion to the other, as will insure our present proud position.

Can disease be kept out of Canada? Of course it can; not one of the diseases referred to arises *de novo;* they are all due to a specific virus, and if all sources of contamination by that virus are avoided, the disease is prevented. It has been argued that an extended frontier renders it impossible for us to prevent the smuggling in of animals at certain points. This argument simply implies ignorance both of the diseases and the means of preventing them. How far will cattle suffering from any of these diseases travel on a trail without showing them? Not many hundred miles. With the carriage of animals on railways prevented, with the police and customs services co-operating with the quarantine service, it would be very difficult to introduce any animals suffering from disease, unless, indeed, it were done maliciously and purposely. No sane man would risk smuggling one or more animals which were liable to seizure, and himself to a heavy fine.

A comparison of the statistics of the value of the live stock in Canada, including horses, cattle, sheep, and swine, as shown by the census of 1871, amounting to 156,607,500 dols., with that of 1881, amounting to 208,633,500 dols., shows an increase of over five millions of dollars a year. It will thus be seen that an immense sum is invested in live stock, and I am proud to be in a position to say that our Canadian stock will compare favourably with that of Great Britain or any other country.

The Ranches in the North-west.

It may be interesting for you to know that the foot hills by the Rocky Mountains is being stocked with animals of excellent quality. Senator Cochrane remarked to me only a few days ago that he saw hundreds of cattle on the Cochrane ranche which would, in point of merit individually apart from pedigree, compare favourably with the thoroughbreds on his Hillhurst farm, which is saying a good deal; and when I tell you that there are already large numbers of pure-bred Hereford and Polled Angus bulls on the ranges, and a strong desire to increase their number, you can see how in a few years Canada will take no back seat as a cattle country. By the papers

last night we learn that the President of the Canadian Pacific Railway Company has gone to England, to arrange for the establishment of a line of steamers between Port Moody, Japan, and China. Who can tell but at no far distant date Canadian cattle will find a market in these countries, for breeding purposes at least? It is far from improbable. I am told by Mr. Arakowa, that the northern part of Japan is admirably adapted for raising cattle, and that the market would be an excellent one. In fact, it is more than probable that the enterprising people who send their most promising young men to all nations where progressive ideas are to be gleaned, have some such object in view in sending him to Canada. At all events, he will, no doubt, form a link in the chain which is being forged to connect the commercial enterprise of the East with this continent. It will thus be seen, gentlemen, that in entering on the study of this profession to-day you adopt a profession which in the future will occupy no mean position, but one of great responsibility. Current events all go to show that it is necessary for you "to be well trained (as Mark Twain said of the babies), for we are going to leave a big contract on your hands."

At the close of the lecture, Dr. Leclerc, Secretary of the Council of Agriculture, translated portions of it in French, for the benefit of the French-Canadians present, and after some remarks by Dr. Osler, the proceedings were brought to a close.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this association was held at the Blackfriars Hotel, Manchester, September 10th, 1884. Tea at 5 p.m. and business at 6 p.m.

There were present—Mr. Peter Taylor, President, in the Chair; Messrs. Thos. Greaves, William Whittle, A. New, J. S. Hurndall, A. Brookes, S. Locke, W. A. Taylor, Jas. Howell, Jno. Lawson, T. Hopkin, Wm. Dacre, and J. B. Wolstenholme, members. Also visitors: Messrs. Banham, Porteus, Carter, Race, Lawson, Herbert, and Laithwood.

The minutes of last meeting were read and confirmed.

Letters of excuse for non-attendance were received from the following gentlemen, viz.—Professors Williams and Walley; Messrs. Wm. Woods, Wm. Leather, E. Faulkner, E. W. H. Darwell, Thos. Briggs, Jas. Marshall, and E. Thompson.

A letter was also received from Mr. E. H. Leach, desiring that his name should be removed from the list of members, owing to his removal to Newmarket. This was agreed to, the members regretting that distance made it impossible for Mr. Leach to attend.

Mr. Greaves nominated for membership Mr. J. H. Cox, M.R.C.V.S., 5th Dragoon Guards; and the Secretary nominated Messrs. Frederick Proctor, M.R.C.V.S., and James Haslam, M.R.C.V.S., both of Manchester.

Mr. Tedbar Hopkin then read a short and practical paper on Quittor, its treatment, as follows:—

Cases of Quittor prove at times intractable and obstinate enough to make us wish for more certain modes of treatment. Some four or five recent cases of sinus with external opening at the coronet have been treated by us with the minimum of annoyance.

Successful surgeons will, I think, bear me out in the statement that a similar line of treatment may be followed by different individuals with very dissimilar results, depending on the neglect or careful observation of minute details. This has been the case with us. I believe, in the treatment of Quittor, we have not adopted any new method, but by the continuation of two well-known modes and careful observation of detail have attained much more satisfactory results.

Our mode of procedure has been as follows :— First we accurately ascertain by means of probes the exact depth and direction of the sinus. We next introduce a hot iron, carefully following the direction of sinus, thus avoiding wounding sound tissue. When by this means the sinus is thoroughly patent, dry tow rubbed in pulv. Hydrarg. perchlor. is introduced. If the sinus is at all tortuous, a fine twig from a hawthorn hedge, with the tow wrapped round, should be passed to the bottom of the sinus and retained there by means of a bandage passed round the coronet. After twenty-four hours remove the bandage and apply warm poultices for ten days to a fortnight, at the end of this time, if successfully done, a slough or core, about the size of your finger and exactly corresponding to the shape of the sinus, will require removing. The patient should be kept quiet, as movement tends to work out the plug too soon.

Caustics which do not convert the sinus into an open wound sufficiently large to admit of the index finger being introduced are useless.

For years I have been in the habit of introducing pulv. Hydrag. perchlor. in a piece of paper folded into the old-fashioned spill shape, but without getting out a slough of any moment, and it has been most unsatisfactory.

The after-treatment we have adopted has either been ointment of vaseline and iodoform, or Lotio plumbi acetat. et tinct. sulph. ; often the ointment first and the lotion to finish with. If indolent or tardy in healing, a cantharidine blister will prove beneficial. When more than one sinus, each should be plugged separately. The worst complication is when you get a sinus running under the lateral cartilage ; in these cases it may be necessary to cut down and remove with the knife a portion of the cartilage. I have, in some of these cases, sloughed away the tissues by applying a paste made with sulphur and sulphuric acid, followed by poultices until the cartilage has been exposed, and after cutting the obstructing portion of the cartilage away, got to the bottom of the sinus ; it is needless to say this requires very carefully doing, or we may open the synovial cavity with so powerful a caustic.

The first case in which we employed the dry tow well covered with the powder was one that had been some months under treatment by a neighbouring practitioner, and when brought to us there were three distinct sinuses. It was a hind foot of a kicking roan mare ; but with strictly following up the line of treatment described, we had the satisfaction of seeing her at work in about six weeks.

No. 2 was a grey cab mare, also in the hind foot. The sinuses ran from above downwards, and in this case we thought it advisable to remove a portion of the wall corresponding to the direction of the sinus before plugging; after which, blister was applied twice, and the animal turned out to grass ; this made a good recovery, and was at work within eight weeks.

No. 3, also a grey cab mare, with one sinus in the hind foot—was plugged as described, and only visited some three or four times, and discharged fit for work in three weeks.

No. 4, a roan cart-horse, also in the hind foot, a case of some standing, with a patch of grease surrounding the external opening of the sinus, with the usual characteristic offensive weeping ; plugging, poulticing, and a cantharidine blister effectively cured both the Quittor and grease in less than four weeks.

You may possibly say that four cases are not sufficient to base an opinion upon, but three of them were certainly bad ones, two because of their old standing, and the other from the direction of the sinus. I should also like to direct your attention to a coincidence, if it is nothing more : two were roans and two were greys : black horses are certainly more subject to grease. Are roans and greys more often affected with Quittor ? and if so, why ?

In concluding the subject, I should like to emphasize the necessity of

following the principle laid down of converting the sinus by means of sloughing into an open wound, and believe this can be most effectually done, first, by means of the hot iron passed into the sinus, which will (if you know accurately the depth and direction) enable you to insert your caustic to the bottom, the iron making it more defined and large enough to receive sufficient caustic to produce the necessary sloughing.

A very interesting discussion followed, in which the speakers indicated the treatment they had found to be most successful.

Mr. GREAVES preferred using a saturated solution of zinc sulphate, and applying blisters to the coronets for three or four successive days.

Mr. PETER TAYLOR thought that each case should be treated as its condition demanded, and that it was advisable to use mild remedies at the onset.

Mr. HOWELL adopted a solution of Hydrarg. perchlor. in spirits, lini 1 ad 8; then using pulv. Hydrarg. perchlor. Be careful and never use arsenic in foot cases; as a mild dressing he preferred zinc sulpho-carbolate in glycerine.

Mr. DACRE referred to the frequency of Quittor, through use of the Charlier shoe.

Messrs. HURNDALL, W. A. TAYLOR, BANHAM, and LOCKE also spoke, after which Mr. HOPKIN replied.

Mr. WOLSTENHOLME exhibited the inferior maxilla of a young female goat, in which both branches were affected with Osteo-sarcoma.

Mr. LAITHWOOD exhibited a small bitch, in which he had successfully performed Cæsarian section.

Mr. JOHN LAWSON related two interesting cases in horses, one in which marked abdominal pain was accompanied by syncope; it recovered; and the other was one of extensive destruction of the skin of haunch by sulphuric acid, in which the centre of the cicatrising area had resisted for months all treatment to produce completion of the process.

Mr. HOPKIN related an unusual case of blood-poisoning which had occurred in the practice of a friend at Congleton, in which the tongue and face of a grey horse were very seriously involved.

Mr. W. A. TAYLOR exhibited the elbow articulation of a young cart-horse in which open-joint had supervened on injury by a kick from another horse.

Mr. GREAVES proposed that a vote of thanks be given to Mr. Hopkin for his valuable and practical paper. This was seconded by Mr. JOHN LAWSON, and carried unanimously.

Date of next meeting to be Monday, December 29th.

JOHN B. WOLSTENHOLME, *Hon. Secretary.*

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 371.)

Mr. GREAVES said it had always been his custom to follow every horse that died of Glanders to the knacker's yard, and there make a close examination of it. He had examined two malignant cases during the past two years, which showed not the slightest vestige of tubercles in the lungs. The lungs did not always form the seat of disease. Several times he had inoculated donkeys by scratching the skin and inserting some glanderous matter; the disease always ensued. Hearing that a cow had died of Glanders in one of the Midland counties, he inserted a good supply of glanderous matter into the body of a cow, repeating the operation five or six times. But he was unable to produce the disease, and was therefore convinced that cows were not liable to it.

Mr. PRITCHARD inquired whether Mr. Greaves understood that the grease from a horse, if inserted into the body of a donkey, would produce Glanders?

Mr. GREAVES said he had heard so, but he had never tried any experiment.

Mr. OLVER asked Mr. Greaves why it was impossible for Glanders to arise spontaneously. All diseases arose spontaneously at some time or other. Some time ago he had a case similar to that mentioned by Mr. Barling, and for some time he was unable to account for it. Ultimately he discovered that the horse had stood in a shoeing forge for a quarter of an hour with another horse, which had been trephined, and had given exit to a large quantity of matter from the frontal sides; this, to his astonishment, turned out to be a case of Glanders.

In reply to the remark that glandered horses do not work, he mentioned that in the old coaching days there were separate studs of glandered horses, which did their work the same as the others, being kept separate from them.

The CHAIRMAN said that although he had only been in Birmingham a few years, he had seen hundreds of cases of Glanders, and he was firmly of opinion that the disease was capable of being generated in the system. If not, why should ninety-nine cases in a hundred occur in old horses? Young horses frequently died from Glanders, the result of bad stables, bad drainage, and bad "doing" had a great deal to do with it. It was impossible to get rid of Glanders when it broke out in a stud, unless they pulled down the stables and built fresh ones. No cleansing or wall-chipping would be of permanent avail. He was certain large numbers of glandered horses were worked constantly on sixty miles of the Junction Canal between London and Birmingham, until the law stopped them. They could not be too firm in telling all their clients how virulent the disease was. Referring to what was called proper inspection of horses, he said that Glanders was not inspected by fit inspectors. People were often allowed to keep a horse suffering from Glanders, when it was, or should be, well known that if it had once been contracted it was certain to break out again. He would rather kill twenty animals on suspicion than pass over a genuine case.

Mr. W. C. BARLING related a curious case of Glanders in a horse attached to a coach running from Newnham to Cheltenham. The disease having broken out, the animal was isolated, and, under good treatment, it appeared to entirely recover. For six years it gave no trouble, and it died as sound and as free from Glanders as it was on the day it was born.

Mr. F. W. BARLING did not think disinfection was efficacious as a remedy against disease. The only way to rid a building of disease was to pull it down. Pulling down the mangers was insufficient. He knew a farmer who had Glanders amongst his horses, two of which he consented to have shot; after they had been removed, the stable was disinfected and no animals were put in it for three or four months, at the end of which period the horses were again placed there; they had only been back a very short time before two or three of them were attacked with Glanders. The farmer then had the stables pulled down, and since then, now two years ago, there had been no trace of the disease upon the premises. This experience confirmed him in the belief that no disinfectants were a perfect cure.

The CHAIRMAN remarked that when veterinary surgeons had a large stud of horses to see to, such, for instance, as those belonging to a railway company, there was no better time for inspecting them than on a Sunday, because this was the day the animals were all at home. Unless constant inspection was made when an outbreak was discovered, it was impossible to get rid of the disease. Horses which apparently were thoroughly well on one Sunday might be attacked with Glanders before the next, and if they did not

show it so early, they most likely would do so before the end of twelve months. Now, as affected horses ought to be removed as quickly as possible, a casual inspection was insufficient. As soon as the affection made its appearance, the horse ought to be killed. He never recommended a man to keep a horse suffering from it.

Mr. F. W. BARLING: As to the inoculation of the ass: have you known a case in which the animal died on the seventh day?

Mr. GREAVES: Yes.

Mr. BARLING replied that he had never known death ensue until the tenth or twelfth day, and he remembered one donkey which took three weeks to die. Constitutional disturbances commenced on about the fifth day. He generally inoculated in three places.

Mr. GREAVES explained that different degrees of susceptibility accounted for different results. Death generally took place on the seventh day, although his experience in some cases had been similar to that of Mr. Barling. Shortly after he left college (in 1846), he was called to examine a number of horses worked on the canal between Manchester and Runcorn. Three hundred horses were employed, and the proprietors had had Glanders in their stables for fifty years or more. Professor Coleman had previously been there, and had condemned fifteen horses at a time. He (Mr. Greaves) had orders to destroy every horse on the banks which he found affected. Thirty he examined and found suspicious, but none were so far advanced in disease as to justify his certifying that they were suffering from Farcy or Glanders. The suspicious cases, however, he caused to be isolated and treated with large quantities of sulphate of iron or copper, and he also trephined twenty of them. This inspection continued every day for three months, and by the end of twelve months there was apparently no case of Glanders remaining, neither did any appear for seven or eight years. At the end of that time, however, it broke out again as virulently as ever. No matter how small the particles of disease-matter might be which were left in any part of a stable, it would be brought out even by a slight change in temperature, and might inoculate a good horse. It was, therefore, impossible to be too particular in attempting to get rid of it; in fact, as the President had said, the best way was to pull down the stable.

Mr. W. C. BARLING said, the chairman had expressed his belief that the disease was originated in horses which were not well cared for. Nothing was so conducive to degeneration as Glanders, and horses which were not well kept seemed to have some peculiar disposition in their system to take it. His practice was chiefly in the Forest of Dean, amongst coal and iron mines, and although cases of Glanders were very common in the pits years ago, twenty or thirty affected animals being brought to the top together, he had only seen one case himself and that not very bad. The stables particularly required ventilation; they were very much in the same condition as they were forty years ago, and yet a case of Glanders was never heard of now.

Mr. GREAVES: Why have you no Glanders if the stables are in that condition?

Mr. BARLING: The horses are better kept than they were many years ago, but they do the same work—day turns and night turns, and sometimes day and night turns.

Mr. GREAVES: And if Glanders could be produced without contagion, it would be found to exist in coalpits. He remembered a stable of cab-horses, the floor of which was made of wood. Beneath the floor, which had not been taken up for many years, there was a collection of débris, which was offensive in the last degree. Yet the horses had slept upon the boards breathing an atmosphere which one would think it was almost impossible to live in for years, and not a single case of Glanders was known. Plenty of

horses had Mange and other diseases, but no Glanders. If the latter had by any chance been introduced, the dirt and filth would have assisted in killing the animals like rotten sheep.

Mr. PRITCHARD asked Mr. Greaves whether he did not think the horses were considerably better cared for and "done" in the present day than they used to be. They did not find the same amount of debility amongst them now as they did years ago, or the other signs of weakness and disease which they understood as the antecedents to Glanders. He had heard his father frequently say that the coach-horses at Wolverhampton were never free from Glanders, and yet they did their work like the rest. If the disease was so extremely contagious, as had been represented, was it not surprising that all the horses in Wolverhampton were not reduced more or less to a glanderous condition? Where in the coaching days they saw 500 cases of Glanders, not one was known now, and why should the contagion be worse now than it was then? It used to be the practice, and it was a very good one, when there was any doubt as to a horse suffering from Glanders, to give him a dose of physic. This would soon develop the disease if any trace of it existed.

Mr. GREAVES referred to the better management of horses now-a-days, in explanation of the large reduction of cases of Glanders compared with the experience of coaching days.

Mr. MEEK was of opinion that it would be well if the law empowered them to slaughter all horses affected with Glanders as they did in the case of Pleuro-pneumonia. At the present time if they slaughtered a horse, which a *post-mortem* examination proved to be free from the disease, they were liable to be called upon to pay for it.

The CHAIRMAN agreed with Mr. Meek, and said he had for years been of opinion that the Association might be doing the profession and the country considerable benefit if they were to try and persuade the Government to give compensation for horses slaughtered when suffering from Glanders, just as they did for cattle killed under the Contagious Diseases (Animals) Act But the first thing to procure was efficient inspection. Hundreds of glandered horses in the country were being worked, and their owners refused to take them to a veterinary surgeon, to say nothing of a professional doctor. This was the chief difficulty, because, as had already been stated, when there was any doubt as to a horse's condition, a dose of physic and a bran mash would soon cause Glanders to pop out if it existed anywhere in the system.

Mr. GREAVES completely endorsed what had been said with regard to compensation. It was quite proper that all suspicious horses should be destroyed. There were large numbers worked in the country, which, though showing no prominent signs of disease, were quite capable of conveying the infection. Such as these were extremely dangerous, in not being considered bad enough to be removed from other horses, because they might poison all horses that went near them.

Specimens.

After the close of the discussion, Mr. BARLING showed an interesting specimen of osseous decomposition, the result of Poll Evil. Mr. DREWITT exhibited the heart of a pig, which was believed had died from Swine Fever. On a *post-mortem* examination being made, however, a tumour was discovered in the heart, and this, instead of Swine Fever, was the cause of death.

Votes of Thanks.

Mr. WRAGG proposed a vote of thanks to Mr. Greaves for his interesting paper.

In seconding the proposition, Mr. MEEK remarked upon Mr. Greaves' kindness in travelling such a long distance to read his paper, and also spoke of the courtesy with which he had listened to his numerous critics.

The vote was expressed by acclamation.

Mr. GREAVES thanked the meeting for their kindness in passing a vote of thanks, and assured them that he regarded it not only as his duty, but as a great pleasure to meet the members of the M.C.V.M.A. They always received him with very great kindness, and gave him every opportunity of advancing his opinions. He had been placed in circumstances of special advantage during the past fifty years, and he had had a very large experience among horses—perhaps the largest in Manchester amongst cart-horses. He was always pleased to give other members of the profession any information he could, and he should be glad to have an opportunity of rendering them a little help at some future time. (Applause.)

On the motion of Mr. PRITCHARD a vote of thanks was accorded to the Chairman for presiding.

Mr. STANLEY briefly acknowledged the compliment, and the proceedings terminated.

Subsequently the majority of members in attendance dined at the hotel, when a very pleasant evening was spent.

WESTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE first half-yearly meeting of this Association was held at the Globe Hotel, Plymouth, on October 16th, J. A. Collings, Esq., in the chair.

Present: Messrs. T. Olver, H. W. Thomas, F. R. Stevens, J. Squires, H. W. Bloye, and the Secretary. The minutes of the last meeting were read and confirmed. Letters and telegrams apologising for non-attendance were received from Messrs. J. P. Short, Warne, Raddall, A. J. Down, W. Penhale, Junr., C. C. Hoadley, C. Parsons, C. H. Golledge, R. L. Penhale, and J. H. Penhale. Messrs. Elder and Hoadley were proposed as new members.

The CHAIRMAN then said that, owing to the lamented death of Mr. Gregory, the first duty of this meeting would be to elect a new President. On the ballot being taken it was found that J. A. Collings, Esq., was unanimously elected to the vacant chair. He said he deeply regretted the circumstances which had arisen to render the election of a President necessary; we had lost one who had been a standing ornament to the profession in the West of England for many years, and he was the last of a generation now passed away.

He truly felt the honour they had done him in electing him President, and would assure them all that nothing should be wanting on his part to keep the Association up to its present standard, and to make it a lasting success.

A letter was next read from Mr. F. Gibbings, resigning his office of Treasurer to the Association, as he was about to move from Bideford to Nottingham. Mr. F. R. Stevens was unanimously elected in his stead.

On the motion of Mr. COLLINGS, and seconded by Mr. STEVENS, the following vote of condolence was forwarded to Mrs. Gregory :—

"The Western Counties Veterinary Medical Association, now assembled in Plymouth, begs to express to Mrs. Gregory its deepest sympathy and regard for her in her recent bereavement. The members of the Association feel that no words of theirs can lessen the sorrow of those nearly related to their late friend and President, but they take it to be a duty to record the great loss they have sustained in the death of one so distinguished and so highly respected as the late Mr. Gregory."

A letter of sympathy from the Association, on the loss of his wife, was also forwarded to Mr. C. Parsons, of Launceston.

The PRESIDENT then read an able and highly instructive paper on some lung diseases of the horse and their sequels.

After a brief introduction, Mr. COLLINGS said he purposed touching on the two important maladies of Pleurisy and Pneumonia and their sequels; and, lastly, to state his views on that more general and specific form of pleuritic Pneumonia which he designated "Lung Fever." After having dealt with the former, he proceeded to draw attention to that form of lung disease which has been predominant for several years past, and which, for brevity's sake, he called Lung Fever. He regarded it as a fermentative action in the circulating fluid, concentrating itself in the lung structure, which, if it terminates favourably, produces the same cleansing and healthful effect on the system generally, as the eruptive fevers in the youth of mankind—in fact, almost taking the place of "Strangles," which may be termed an eruptive fever of the horse. This Lung Fever has many degrees of intensity, many associations, both at its commencement and during its course, and many sequels. In the mildest form it assumes simple Low Fever type, with but trifling increase of pulsation or respiration, which, with six or seven days of good care and ordinary treatment, passes away and leaves the patient convalescent.

In more decided cases, it follows, after three or four days, in the wake of a Low Bilious Fever attack; and again at times it shows itself boldly as a primary disease. The special feature he considered to be the extreme prostration accompanying it.

He sketched the following case:—

Patient standing dull and dispirited, and very prostrate; head down; fore legs generally wide apart; pulse 60 to 75; respirations 24 to 30 to the minute; membranes injected and of a dirty, cloudy hue; prolonged grunt, indicative of considerable pain, when turned, or rather, pulled round either way; extremities variable. The most advisable treatment to follow he found to be the exhibition of a saline with a stimulant. He preferred Sodæ sulph. ʒiv., Spts. eth. nit. *cum* Liq. am. acet. ʒii. *aa*, followed eight or ten hours afterwards by a ball—Ammon. carb., Potass. chlor. ʒii. *aa*, Camphor ʒi. daily. Actively stimulate both sides and chest with mustard, carrying it half way up the trachea; keep the extremities warm. To be followed in due course by vegetable tonics. He especially invited discussion as to the repetition of counter-irritation, and the frequency of stimulants. He never used mustard more than twice, as the action of it will be found quite sufficient once only repeated. Speaking of effusion, he said in our patients it is from auscultation that we must derive our most positive indication of effusion. He believed, with regard to its treatment, that it has been generally accepted as an established fact in horse-practice that when pleuritic effusion has once commenced, it gradually, although at intervals, increases until a fatal termination ensues; but he did not concur in this opinion, feeling confident that many cases, where considerable effusion has existed, have yielded to the action of the iodides, combined with general repletive treatment. This last is of great importance. As to the duration of pleuritic effusion, he had known it extend over a period of four or five weeks, the patient feeding well and heartily the whole time, and then walk over a mile to a knacker's yard. In this case both pleural sacs were nearly full, the lungs compressed and flattened so much that not one-twentieth part of their normal volume could have latterly assisted this animal in respiration.

After having described the operation of paracentesis thoracis, he said, on the subject of congestion, that when severe, it not unfrequently brings about a fatal termination in a few hours, and in such cases is usually designated

"Apoplexy of the Lungs." He had known a blood harness horse, in fairly good condition, die in three hours after a journey of ten miles. In the *post-mortem* of this particular case it was found that rupture of the lung tissue had taken place, and the deeply-carbonised venous blood, mixed with an effusion of frothy mucus, had filled the tubes and caused Asphyxia. He added that there is another most potent factor in bringing about a fatal termination, and that is embolism. By it we understand that a vessel has been obstructed by a fibrinous clot, which might have formed in the heart, or in the circulatory system, either arterial or venous, and by impulsion the clot has been forced into a vessel so as to plug it and obliterate its cavity completely. The consequence of such accident depends, of course, upon the importance of the particular vessel to the function of life. When it occurs in the pulmonary artery, death is almost instantaneous; if an artery in a muscular part, decomposition, gangrene, and sloughing must result.

There exists considerable difference of opinion as to the mechanism of the formation of these clots. He was inclined to believe that the cause of embolism must be in some special condition of the blood itself, probably an undue fibrinous condition of it; or, on the other hand, as Dr. Richardson attributes the fluidity of the blood to the ammonia it contains, embolism may result from a lack of that substance. Whatever the cause of it may be, he thought this clotting played a very important part in many of the diseases of our domestic animals, and the thinking pathologist may do well to bear this subject in mind when investigating such diseases as Splenic Apoplexy and Quarter-evil in cattle.

The conclusion of the paper was received with applause. An interesting discussion followed.

Mr. SQUIRES thought there could be no doubt but there were two forms of both Pneumonia and Pleurisy, one mainly arising from exposure to cold and inclement weather, the other to a specific virus in the atmosphere, which acted specially on young horses brought from the country into large towns, first producing the disease commonly called Influenza, which, under certain circumstances, notably that of undue exertion, ran on to Pneumonia and even Pleuro-pneumonia. He quite agreed with the essayist in his treatment of these cases.

Mr. THOMAS was of opinion that by far the large majority of cases of Pneumonia now occurring in large towns were due to a vitiated atmosphere, and were not at all like the old-fashioned attacks, which it was customary to treat by bleeding, blistering, aloes, and tartar emetic. He had now quite given up that line of treatment, and relied almost entirely on stimulants, preferring Spts. eth. nit. and Liq. am. acet., to be followed in due course by tonics and good food, and always with as liberal allowance of fresh air as circumstances permitted. He should like to hear Mr. Collings' opinion on counter-irritation. For his own part he had quite given up the use of cantharides as a counter-irritant, he found that it so frequently became absorbed into the system, and acted on the kidneys in such a manner as to produce grave symptoms; he now used mustard or a weak preparation of biniodide of mercury. In Hydrothorax he preferred digitalis to any other medicine. He had performed the operation of paracentesis thoracis on several cases, but on only one with success. In Purpura Hæmorrhagica he considered Ol. tereb. a most valuable remedy given in large doses, ʒiv. twice a day, to be followed by Ferri sesquichlor. in frequent doses, and chlorate of potash.

Mr. BLOYE was much in favour of Prof. Robertson's method of administering medicine in the form of an electuary placed on the animal's tongue, especially when suffering from cold and sore throat. He drew attention to the aspirator as being a most convenient and safe instrument for the removal of fluid from the cavity of the chest; the evils and dangers of the trocar and

cannula being avoided by its use. The instrument was a very simple one, and might be used with perfect safety by any surgeon.

Mr. OLVER strongly advocated frequent hot-water fomentations; he believed his patients found more relief from this than from violent counter-irritation to the sides; the only drawback to this plan was that as soon as the adviser's back was turned this remedy was often neglected; in rural districts he was quite certain this was sometimes the case. As for medicine, he was greatly in favour of Tr. aconite; in cases of oppressed and quickened breathing, with a heightened pulse, it appeared to afford relief sooner than anything he had tried. This, combined with the advantages of pure country air, is speedy in its action, and but rarely evanescent, as is often the case with stimulants.

Mr. STEVENS said that in dealing with these cases he attached great weight and importance to the internal temperature, for we are often able to judge the animal's condition better by the index of the thermometer than any other symptom; it was also a safe guide as to when one class of medicines may be substituted for another.

He deprecated the excessive use of counter-irritants, for not only did it frequently cause the sides of the patient to be blemished in an irreparable manner, but also on account of its irritating and exciting effects on the sick animal. He had seen more than one horse roll and throw itself about a box in a most violent and alarming manner from the smarting of an application of mustard to the chest. He could not help thinking that this method of cure, sometimes at least, led to worse results than would be the case if a milder and more soothing system were adopted.

Mr. COLLINGS, in replying, said he firmly advised at least one powerful application of mustard; the administration of internal stimulants he thought insufficient to rouse the vital action without counter-irritation. If his patient was not relieved twenty-four hours after the first application of mustard, he repeated, but he never went further than this; he was a strong advocate of counter-irritation. He then gave his experience of a very interesting but obstinate case of Purpura Hæmorrhagica, which only yielded to the treatment of carbolic acid and iron.

Mr. THOMAS proposed, and Mr. OLVER seconded a vote of thanks to Mr. Collings for his valuable paper, and only wished there had been more there to hear it.

The PRESIDENT announced that the next meeting would be held in Exeter, on the second Thursday in March, when Mr. Thomas would read a paper on the Diseases of Young Stock.

After the meeting the Association was invited to an excellent dinner provided by the members residing in Plymouth.

W. PENHALE, *Hon. Sec.*

THE WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

THE ordinary quarterly meeting was held in the Veterinary College, Glasgow, on Wednesday, October 29th, 1884. The President, Mr. Campbell, occupied the chair. Present—Prof. McCall; Prof. Lewis, Edinburgh; Messrs. G. Fenton, A.V.D., McGill, London; Robinson, Jr., Greenock; Jarvie, Carluke; Hunter, Dundee; Constable, Inchture; Gardner, Helensburgh; Peddie, Cathcart; Houston and McGeoch, Paisley; Nesbit, Galston; Kerr, Dalry; Taylor, Cathkin; Allan, Clarkston; Bowie, Stranraer; McIlwraith, Milngavie; McDonald, Campbelltown; McGregor, Ayr; W. Anderson, Jr., Mitchell, Weir, Wyper, Boyle, Tweedley, Frew, Muir, Stewart, and the Secretary, Glasgow.

The Minutes of last meeting having been read and approved, the office-

bearers for 1885 were nominated, as follows—President, Mr. Campbell, Kirkcudbright; Vice-Presidents, Prof. McCall, Messrs. W. Anderson, Jr., and A. Robinson, Jr.; Treas. and Secy., J. Macqueen.

The PRESIDENT called the attention of the members to a letter which he had received from Prof. Walley, asking him to bring before the meeting the subject of subscribing to the Building Fund for the new Home for the R.C.V.S. Several members having spoken in praise of the scheme, it was agreed to leave the matter to the discretion of the members individually.

Prof. LEWIS said that his chief object in attending the meeting was to ascertain when and where the annual conjoint dinner of the three Scottish societies will be held. He understood that the Scottish Central Society was in a state of suspension, and therefore unable to take any active part in the celebration.

Mr. CONSTABLE said that the Scottish Central Society felt it could not take the responsibility of superintending the dinner this year; but that its members would be very pleased to assist as far as possible in making the meeting a success, if held in Glasgow or in Edinburgh.

The PRESIDENT said the dinner must take place, and if the Scottish Central could not carry out its share, then the West of Scotland Society must make the necessary arrangements to hold the reunion in Glasgow.

Mr. ROBINSON spoke in support of the Chairman's remarks. It was agreed to entrust the whole arrangements to the Presidents and Secretaries of the three Scottish societies.

Mr. ANDERSON, Jr., in a spirited speech, directed the attention of the members to some recent prosecutions for cruelty by the Glasgow Society for the Prevention of Cruelty to Animals. He said the manner in which the prosecutions are carried on is shameful, and he thought some steps should be taken to ensure consideration and respect for veterinary evidence in the police-courts. In one case the treasurer of the "Cruelty Society" sat on the Bench as a magistrate, and he need hardly add that the case went against the defender.

Messrs. MITCHELL and PEDDIE also gave particulars of cases in which they considered they had been badly treated.

Mr. BOYLE said that veterinary surgeons were much to blame for the way in which their evidence was received. Some of them attended court and bolstered up cases that they knew were really well-founded cases of cruelty, simply because the defender happened to be a client.

Mr. ANDERSON in reply said that he would act for himself in the meantime, and that he would prepare a paper on "Cruelty to Animals in all its Phases," which he would read at next meeting.

The PRESIDENT then read an interesting and highly instructive paper on Rheumatic Arthritis in foals. In the short discussion which followed, Messrs. Mitchell and Weir were the chief speakers.

After the usual vote of thanks, the meeting terminated.

J. MACQUEEN, *Secretary.*

ROYAL AGRICULTURAL SOCIETY.

AT the monthly Council-meeting of this Society, held on November 5th,

Lord EGERTON (Chairman) reported that the Committee had received letters from the Newcastle Hide Inspection Society on the subject of a prize of £30, which they propose to offer for the best essay on "Warbles in Hides—their cause and prevention or cure," and that, in accordance with their request, the Committee had nominated adjudicators. A report had been received from Professor Axe on an outbreak of abortion and premature birth in the ewe-flocks of Lincolnshire, a copy of which he had furnished to

the Lincolnshire Agricultural Society. A deputation from the Royal College of Veterinary Surgeons had had an interview with the Committee in reference to the Society's recent veterinary appointments, and the delegating to certain veterinary surgeons the Society's authority to supply the medicines recommended by Professor Brown in his paper on the "Domestic Veterinary Treatment of Animals of the Farm;" but the Committee saw no reason to change their opinion on the subject.

This report having been received, the Chairman gave notice that at the next meeting of the Council he would move for the removal of the veterinary grant for the year 1885.

Mr. DENT moved "That in the opinion of this Council it is desirable that the Privy Council should issue such an order, binding upon all local authorities in counties and boroughs in Great Britain, as may provide for the satisfactory isolation of all animals in infected places, and the disinfection of all persons and things which may have been in contact with the same, and so do away with the necessity of licences for the removal of cattle from the district of one local authority to another." Mr. Dent stated that the local authorities of the northern counties had already had one conference on the matter, and proposed to hold another, and he believed that the authorities of the Privy Council only wanted some pressure put upon them. There was already an order by which, immediately on the outbreak of Foot-and-Mouth Disease, the place was declared an infected circle, out of which no infected animal could be moved; but we wanted to ensure that these animals should be carefully watched, and that all infected animals should be carefully isolated. As at the present moment there was no Foot-and-Mouth Disease, it appeared to him that this was the time to take action, with the view of stamping out any case that might unfortunately occur. Such an order as he contemplated would do away with one of the greatest nuisances and frauds, that is, the issue of licences for the removal of cattle; and it would also, he believed, enable all the markets to be kept open, and the trade of the country would be very little interfered with.

After a conversation, Mr. WAKEFIELD seconded Mr. Dent's motion, which was carried unanimously.

Professor BROWN reported that, since August 6th, fresh outbreaks of Foot-and-Mouth Disease had been reported as follows:—Week ended August 16th, two outbreaks; August 23rd, three; August 30th, three; September 6th, one; September 13th, three; September 20th, one; total, 13. These outbreaks occurred in Essex, Gloucester, Hants, Kent, Leicester, and Norfolk. The whole of the diseased animals had recovered by October 11th, and since that time no case had been reported to the Agricultural Department.

Army Veterinary Department.

VETERINARY Surgeons Dwyer, Day, Joslen, Fenton, and Kelly have embarked for India.

Accompanying the British Force on its long and fatiguing march for the relief of Khartoum, are Veterinary Surgeons Burt, Clayton, Smith (S.M.), Bennett, Griffiths, Mitchell, Beech. Veterinary Surgeons Queripel, Jones, and Spooner have also embarked for service in Egypt. The Army Force intended to operate in the Zhob Valley (Afghanistan), against certain disorderly tribes, is accompanied by Veterinary Surgeons Pringle and Raymond. Strange to say, the Afghan Russian Frontier Commission, which has started from India to define the limits between these two countries, and which consists of more

than 300 horses, and a transport of 600 mules and 1,400 camels, has no veterinary surgeon with it. This is all the more remarkable as the duties will be very arduous and extend over a long period of time.

An expedition to Bechuanaland, South Africa, having been determined upon, Veterinary Surgeons Woods, Crawford, Cox, Elphick, and Berne have embarked for service in that country. Veterinary Surgeon Woods was despatched from England to Cairo to take charge of the 19th Hussar horses (that regiment being mounted on native horses while in the Soudan), and to accompany them through the Red Sea to Natal, where they will be mounted by the 13th Hussars, which proceeds from India to that colony, there to remain until the disturbances have been quelled. Veterinary Surgeon Rutherford marches with the 6th Dragoons from Natal to the Cape Colony to take part in the expedition to Bechuanaland.

Notes and News.

INTERNATIONAL HEALTH EXHIBITION.—We understand that Spratts Patent have received a prize medal at the International Health Exhibition, 1884, being the highest and only award for their class of goods. It also gives us great pleasure to learn that the gold medal and certificate of honour have been awarded to M. Pasteur for his laboratory inventions and his investigations in pathology. It is likewise gratifying to find that a silver medal has been awarded to Professor Tuson, of the Royal Veterinary College, for his new disinfectant preparations.

MANITOBA.—We are pleased to learn that this most promising portion of our North American territory is making an excellent commencement in prosperity by instituting a Department of Agricultural Statistics and Health. The work of the Department embraces, among other things, the establishment of a veterinary school, the supervision of the practice of veterinary surgery and the licensing of practitioners, and the enforcement of the laws relating to diseases of animals, with the assistance of a veterinary sanitary service, embracing a consulting veterinarian to the Department, and a district veterinarian in each county.

EXPORT AND IMPORT OF HORSES.—During the month of September the number of horses exported from this country was 660, against 950 in the corresponding month last year. To British North America 178 were sent; Belgium, 112; France, 105; United States, 56; and other countries, 209. The exports for the nine months ended September 30th were 5,832, against 6,077 in the corresponding period last year. The value of the exports last month was £32,942, and for the nine months £342,281. The value for the same nine months last year was £340,373. We imported in September 1,291 horses, against 712 in the corresponding month of last year. The horse export for the nine months is 10,836, against 7,724 last year. The value of the import in September was £21,790, and for the nine months £209,568, against £155,966 last year.

CAMELS.—The British military authorities having decided to employ a Camel Corps in Egypt, have issued an order instructing the soldiers to treat the camels "with kindness and consideration," and strictly forbidding the use of "foul language" in the hearing of those interesting animals. The camel is said by those who are well acquainted with him to be about one-third more exasperating than the army mule. Like the latter beast, he kicks but, his legs being strengthened by natural angle irons, and being twice as

long as the mule's legs, he can do correspondingly greater execution with them. No intelligent Arab will approach within eighty feet of a camel's hind legs, and even with this precaution nearly one-half of an average Arab caravan is kept in the air by accidents from camels' legs. As for biting, the army mule is a mere beginner in comparison with the camel, who will bite entirely through a mountain howitzer without an effort. The mule has his intervals of good temper, but the camel is always misanthropic. Moreover, the camel is rendered so conceited by the possession of half a dozen spare stomachs, with watertight bulkheads, that he will never sacrifice his opinion to that of his driver. And this is the animal who is to be treated with "kindness and consideration," and who is never to be whipped or sworn at! If this order is obeyed the fate of the Camel Corps can be easily foreseen. Heedless of the coaxing of the driver, the camels will carry the British soldiers who are compelled to mount them straight into the heart of the Sahara, where the soldiers will either perish of thirst or of camels' heels. In vain will they be addressed as "good camels," and offered sugar and other delicacies. The beasts will be filled with contempt for the weakness of their riders, and will lose no time in demonstrating that a healthy camel is the master of the man who treats him with kindness and consideration. What Lord Wolseley ought to do is to send to America for a corps of veteran army teamsters, selecting only those who can pass a good examination in competitive swearing. These men might be able to manage the camels as well as the Canadian *voyageurs* are able to manage the rapids of the Nile. At any rate the order requiring camels to be treated with kindness and consideration should be promptly rescinded, for kindness is as completely thrown away upon the camel as reasoning is thrown away upon the Blaine man. —*New York Times.*

A Poisonous Leguminous Plant.—It is stated that in the valley of the Missouri grows a weed known as wild pea, or rattle-box. This the horses have learned to eat, and the effect is a slow wasting away, even on good pasture and with good food, and death follows. In a number of cases there was stupor, the animals often falling asleep while eating. In some instances the animals would remain standing for a whole week, sleeping much of the time with head resting against some object. Professor M. Stalker, of the Veterinary College, at Ames, Ia., has been making a careful study of the malady and its cause, and finds that the disease has been known in this region for three or four years, but had not until the present summer prevailed to such an extent as to attract general public attention. But now the loss in horse stock on some farms was not to be counted by hundreds, but by thousands of dollars. It would be interesting to know whether this poisonous "wild pea" is identical with, or related to, a poisonous leguminous plant belonging to the tribe Indigofera, which, after recent droughts, has occasioned great losses—amongst stock-sheep especially—in the Australian Colonies.

Dogs in Australia.—The Agent-General for New South Wales is informed that the prohibition against the importation of dogs into New South Wales has been removed, but dogs from places outside the Australasian Colonies will be subject to quarantine for six months after arrival.

The late Professor Ercolani.—A short time ago we announced the death of the very distinguished anatomist, zoologist, and veterinarian, Professor Count Ercolani, of the Bologna University, and who was also an Honorary Associate of the Royal College of Veterinary Surgeons. We now learn that his widow has presented his veterinary library to the municipality of Bologna, his native city. For rare manuscripts and books in the special subject, the collection is said to be unrivalled in the world.

Correspondence.

THE PRACTICAL EDUCATION OF STUDENTS AND VETERINARY SURGEONS.

DEAR SIR,—The subject of your editorial in the current number of the VETERINARY JOURNAL is of such vast importance to our profession, that I am induced to ask you to kindly insert the following remarks in your pages.

Perhaps at no period within our recollection has the want of practical knowledge been so prevalent as it is at the present time, not only amongst candidates for the diploma of the Royal College of Veterinary Surgeons, but also amongst those who have actually passed their final examination, and who are, therefore, considered to be fit and proper persons to practise their profession. It is very humiliating to have to confess that such a state of things as this exists, but the fact is, nevertheless, perfectly true, and it is only by placing it forcibly before the members of our profession, and giving the subject thorough ventilation, that the cause can be arrived at and the remedy suggested.

As a proof of this deplorable deficiency of practical knowledge, I need only refer to the number of unsuccessful candidates who, during the past two years, have competed at the various examinations for commissions in the Army Veterinary Department. The majority failed to pass the practical test, and it will doubtless surprise many of your readers to learn that amongst them were found those who were actually incompetent to perform the most ordinary operations—to detect the lame leg, to "fix" the seat of the various exostoses, or to describe the "points" on the living animal so well known to almost every horseman. I could, if necessary, give many other instances of unpardonable professional incompetence which, from time to time, have been brought to my knowledge, but the above illustration is quite sufficient to point out the urgent necessity that exists for reform. Not only is this demanded for the sake of the profession generally, but also in the interests of the student: for does not his success in life depend, in a great measure, upon his knowledge of the various details of everyday practice? and, if he be found wanting in this respect, or deficient in manipulative dexterity at the commencement of his career, how is it possible that he can succeed?

I have heard it remarked that "with a sound groundwork of scientific teaching, practical knowledge will follow in due course;" but with this I do not agree. Both are necessary; but if the young practitioner be deficient in the latter, he will unquestionably fail. I do not contend that the majority of failures are to be attributed to this cause, for there are others too numerous to mention, that operate as bars to professional advancement; but I do maintain that in these days of professional competition a young veterinary surgeon has very little chance of earning his daily bread, unless he is possessed of something more than mere scientific and theoretical knowledge.

The picture drawn in your able editorial of the "weak-kneed" and undecided way of examining a horse "points a moral," and should act as a stimulant to all who aspire to make a name for themselves in our profession. Horsemen, as a rule, are very observant, and are by no means bad judges of the way this duty should be performed; and are certainly not the class of men to trust the examination of a valuable animal to an incompetent practitioner. Too much stress cannot be laid on the necessity of giving students every opportunity of becoming familiar with this important branch of their profession. Teach them to go about their work in a systematic manner—for examining horses without method is something like attempting

to steer a ship without a rudder—and then, if the necessary facilities for practising upon all classes of horses are afforded them, it will be their own faults if they fail.

As some men are born horsemen, so, doubtless, are others born veterinarians ; and, although we can offer suggestions easily enough on the various points where reform is needed, we cannot ensure equal success in all cases.

The above remarks on the examination of horses for soundness, will apply also to the performance of operations, the different methods of securing the patient, and the various details of manipulation generally.

It is useless to expect expertness without practice. No amount of lectures on surgery, or demonstrations, will make a successful operator, unless the pupil is allowed to do the work *with his own hands*, under the supervision of experienced teachers. He requires, amongst other things, that delicacy of manipulation and self-confidence which are only to be acquired by practice.

Assuming that this practical inefficiency is a recognised fact, the great questions with which the profession has to deal are—*firstly*, *the cause*, and, *secondly*, *the remedy*.

With regard to the first, it is difficult to believe that the fault lies with the student ; for not only has the educational standard for admission to the schools been raised, but the men who join now are certainly not socially inferior as a class to those who studied fifteen or twenty years ago. And yet, notwithstanding a much longer course of professional teaching at college, an increased staff of professors, and many other advantages, it is very generally admitted that, from a practical point of view, the former cannot compare with the latter.

It may well be asked : How do you account for this anomaly? If the student is not to blame, with whom does the fault lie? Does it rest with the teachers, the system of teaching, or with the examiners?

I have the privilege to be personally acquainted with the principals and most of the professors of our teaching schools in London and Scotland, and am convinced that their duties are performed conscientiously, and that nothing is left undone by them to educate their pupils up to such a standard of efficiency as the means and time at their disposal will allow. Blame has been attached to the teachers, and complaints made by students and others, both against them and the examiners have been numerous ; but I think in the majority of instances these accusations have been made without duly analysing the question, or taking into consideration what I consider to be the principal cause of this practical inefficiency, and which will be presently alluded to.

The system of teaching has also been attacked, and it has been stated that so much time is occupied in the ordinary college curriculum, by the multiplicity of scientific subjects taught, that a proper instruction in the practical details so essential to success in after life is impossible. This statement may be true, but in any case it is rash and unwise to blame a system without thoroughly understanding the situation. None of the subjects taught can be dispensed with ; on the contrary, the daily increasing importance of the profession, the rapid progress it has made during the last few years, and the position it now occupies amongst other scientific bodies, demand that the education of the student should be increased rather than diminished.

The responsibility for the practical shortcomings of the students cannot be allowed to rest with the examiners. Their duties are onerous and of the highest importance ; but it is not their province to impart instruction. They are merely the judges of the pupil's efficiency, and with them rests the power to "pass" or "reject."

The examiners have been accused of undue severity in rejecting so many students at the late final examinations, but a more unjust accusation could

not have been made; for so imperfect was the practical knowledge of the candidates generally, that, had not the examiners been exceedingly lenient, the number of rejections would have been much more numerous.

I consider the principal cause of this inefficiency arises from the fact that very many students enter the various teaching schools utterly ignorant of the most ordinary details of private practice. They are sent to college fresh from home or school, without having seen so much as a dose of medicine administered, or a horse's foot examined, and are expected to compete with men who have had two or three years' sound practical instruction, at the hands of a competent veterinary surgeon, prior to commencing their college career. Such culpable negligence is both unfair to the student and unjust to the profession, and is more than likely to be productive of failure to the one, and to bring discredit upon the other. The success or otherwise of a student does not rest entirely with himself, but in a great measure with his parents. Their responsibility is very great, and if they neglect their duty, by omitting to give him the opportunity of laying the foundation of that sound practical knowledge which is so essential to success during his career as a student, and also in after life, the fault is theirs.

No young man should be allowed to enter any of our teaching schools without having served an apprenticeship of at least two years with a veterinary surgeon. It is all very well to say that the college curriculum includes clinical instruction, surgical operations, and the various details of practical work; but I contend that it is impossible for any individual student to obtain a sufficient amount of practical knowledge from the teaching given within the college walls. It is necessary that he should do the work with his own hands *over and over again;* that he should be familiar with each particular detail and with all classes of animals: and I ask, how can this be expected with crowded classes and a limited practice?

In a former part of this paper, I remarked that the school turned out better practical men twenty years ago, after a course of study of two sessions only, than they do now with an increased curriculum and other advantages. The reason, however, is obvious: in those days very few students dreamt of entering college without having previously seen practice with a veterinary surgeon, and consequently, by the aid of this elementary preparation, were enabled the more easily to grasp the subjects of their various studies.

Make a fixed term of pupilage compulsory prior to admission to college, and I venture to say that the true and only remedy will be found for practical inefficiency.

Of course we shall always have a certain percentage of failures. There are black sheep in every community, and no amount of legislation or conscientious teaching will compensate for indolence, educational deficiency, or mental incompetence.

In conclusion, I venture to offer a few words of advice to parents, and also to veterinary surgeons. To the former I would say: Place your son with some well-known and popular practitioner of good social position, where he will have the combined advantages of a good home and a large mixed practice. The premium may be somewhat high, but depend upon it you will be repaid for the outlay.

To the latter I would offer the following remarks:—

The professional success of your pupil depends, in a great measure, upon the manner in which his instruction is conducted. Give him every opportunity of seeing hospital practice, operations, examinations, etc., and when he is sufficiently advanced, let him do the work with his own hands under your supervision. Teach him to be thoroughly expert in compounding and administering medicines, but do not confine him for months to the drudgery

of the pharmacy. Many a youngster has contracted a distaste for his profession on this account. Give him a good, sound, conscientious training. Treat him at all times with consideration and patience, and combine kindness with firmness. You have other responsibilities of a moral and social nature, to which I need not refer. It is sufficient to remark that if a proper feeling is established between instructor and pupil, the work of teaching and the labour of learning will become a pleasure to both.

"A REFORMER."

SIR,—I read your editorial remarks on the above, and I quite agree with you that the present state of things loudly calls for improvement. The teaching of the schools admits of great reform, and in nothing so much as in matters of a directly practical character. Hasty knowledge is always superficial, and it is high time something were done to insist that students should have a practical knowledge of their profession before they obtain the diploma of the Royal College of Veterinary Surgeons, as many of them are lamentably ignorant, more particularly as regards the examination of horses as to soundness. The senior students ought to be compelled to examine three or four horses each week, and to write certificates of soundness or unsoundness ; they would then have confidence in their opinions, and find the benefit of it when they came to practise for themselves. Knowledge can only progress with high-minded, increasing rivalry; and relying, sir, as I do, on the philanthropy and zeal which have so long characterised the professors of the various veterinary colleges, I venture to hope that they will give the matter their serious consideration, and I have no doubt that the students will derive the greatest possible benefit from being obliged to learn *the practical rudiments of their profession.*

T. D. LAMBERT, F.R.C.V.S.

Dublin, 13*th Nov.*, 1884.

AN EXCULPATION.

SIR,—I trust that you will kindly allow me space for a few remarks, in answer to the accusations made against Professor Brown by "A Late London Student," in your journal for November. In the first place, the comparisons the writer makes between Professors Brown and Robertson, two men each gifted with such totally different powers of imparting their knowledge, are without question absurd. Each does his best in his own special department. In the second place, the "Late Student" complains that if students relied on Professor Brown's lectures to enable them to pass their final examination, they would probably fail. This is also absurd, for what student possessed of common sense would try to pass any examination without supplementing his attendance at lectures by careful study of standard authors. During the time I spent in Class C., Professor Brown put himself to great inconvenience to do all in his power to aid his pupils in a practical as well as in a theoretical manner. No pains were spared in procuring specimens of Foot-and-Mouth Disease, Sheep Scab, Chronic and Acute Tuberculosis, Contagious Pleuro-pneumonia (Acute, Sub-acute, and Chronic), Sporadic pneumonia, and Swine Plague, etc., etc. Could the "Late London

Student" expect Professor Brown to teach him to drench cows, pass probangs, insert trocars, and other such simple operations, which he ought to have learned during an apprenticeship? Again, what can a friend mean by giving a full list of Professor Brown's lectures? We have read it, and consider it not only sufficient, but exhaustive. And further, even if not sufficient, is not Professor Brown at liberty to add to subjects to his list, if he may think necessary? It often happens, indeed, that those from whom we may expect most turn out the most ungrateful.—I am, dear sir, yours faithfully,

Louth. JAMES BRODIE GRESSWELL.

"OUR PROFESSION AND ITS GOVERNMENT."

SIR,—At the close of the year I crave space for a few words.

I. *The Constitution and Council.*—For forty years London has been the home of the R.C.V.S. Every Council Meeting and every Annual General Meeting—save one—has been held there. Four or five hundred Southern practitioners have sat on its Council and Examining Board; of the veterinary surgeons of Scotland and Ireland, two or three dozen. A good man North can scarcely get a seat in the Council; a man no better in London is almost sure of election. A man from Scotland must be a luminary; a state of incandescence suffices for the South. The petition of the Scotch societies for better representation and government was quietly returned to them, its merits or demerits not entered on; and how any man with these facts before him can stand up and say that all is "as fair and impartial as need be," is beyond me. On the very face of the system are the marks of unfairness and wrong.

II. *Pupilage.*—Compulsory, for one, two, or three years, places a big barrier in the way of deserving students with good brains and hands, but scant funds. Many parents and guardians find College fees, board, and expenses quite enough without an additional "pupilage" burden and its premium. The pupils are 600; where the tutors? Each examiner is paid £5 a day. The profession and those who enter it pay the examiners £1,000 a year. Pupilage may surely be dispensed with.

III. *Fellowship.*—"100 F.R.C.V.S.," "1,900 M.R.C.V.S." Wherein consists the superiority of this one hundred? "Murmurs" have reached us that one Fellowship examiner retired—that some of the young Fellows who came first to the "bridge" got very easily over—that their appearance at the examining table was no credit to them—that strictly speaking they should have been rejected. May the profession be preserved from such Fellows. When the superiority of the Fellows is so evident as not to require to be made apparent, then let them be sole Councillors and Examiners—not till then. 1906 possibly, not 1886.

IV. "*Merit.*"—Thirty-six southern practitioners *on their merits* councillors and examiners, and half-a-dozen of the veterinary surgeons of Scotland and Ireland? The "best" men, the men of the greatest knowledge, skill, and integrity, almost without exception on the other side of the Border? Six-and-thirty wise and judicious men in England, half-a-dozen in Scotland and Ireland? "Merit" of this kind is a bubble that needs but to be pricked; a "pitcher that will not hold water."

V. *Impartiality.*—Instead of all being as "fair and impartial as need be," the Council chamber has almost each May presented the appearance of a chamber quarter swept and washed, into which four-and-twenty Southern men have entered, and chosen six other Southern men like themselves as Vice-Presidents; and the end of that chamber has been as the beginning.

VI. "*Progress.*"—A profession divided for forty years. A Council for forty years unable to understand or come to terms with the Highland Society. A

Veterinary Surgeons Act forty years after the granting of the Charter. Pupilage rescinded ; the Examining Board being amended ; Fellowship as regards Council and examinations to be re-considered. With a truly representative council at first and now, the path of progress would surely have been shorter, smoother, easier.

VII. *The Examining Board.*—In 1882 not a single veterinary surgeon in Ireland or Scotland fit for the Examining Board ; twelve better men found in England ! Did this Board give satisfaction ? Let teachers, students, parents, and guardians answer. Why have "two more examiners been added to the horse and cattle practice tables"? Why this talk of more examiners ? A mixed and rather more numerous Board—a Board of good, right men, fair specimens of English, Scottish, and Irish veterinary surgeons—is surely *the* Examining Board required by the R.C.V.S., and it would have been well, in my humble opinion, for the profession at large had Council and Examining Board been always thus constituted.

VIII. *Parliamentary Basis.*—A representative governing body should all the world over represent those whom it governs. Parliament represents the nation ; the Council should represent the profession. Twenty London and Lancashire practitioners, and a few provincials, left very much to the freedom of their own will, no more, so far as I am able to judge, represent the veterinary surgeons throughout the three kingdoms, than 450 London and Manchester citizens and a few provincials, free, unpledged, and irresponsible to constituents, would represent the people of Great Britain and Ireland. The veterinary profession has long filled its Council by modes of election which the common sense and intelligence of the country would not for one moment tolerate, and in its progress (VI.) read the result. By a show of hands at a meeting in London, or by a general vote or plebiscite, a truly representative council never has, and probably never will be obtained ; the only available way, to the best of my knowledge, recognised in this country, is our Parliamentary mode of election.

Parliamentary representation, or a Parliamentary election, is *not* a "returning of local representatives," *not* a "territorial arrangement," *not* a "geographical distribution," *not* a mechanical idea," *not* "sentimental *nor* absurd," *not* an election "*from* sections of the profession"; its advocates are *not* "party spirits" with tails of "murmurs and discontent."

Who cares for the nationality of our English, Scotch, and Irish Members of Parliament ? But have not the people of England, Scotland, and Ireland power separately and within themselves to elect their members and representatives, and do not these members and representatives meet in the House of Commons, and is not the House of Commons the "noblest legislative assembly in the world"? The advocates of Parliamentary representation would give the veterinary surgeons of Scotland power *within themselves* to elect their representatives. They would extend the same justice to the veterinary surgeons of England and Ireland. And they would have these representatives—be they Englishmen, Scotchmen, Irishmen, or Dutchmen, no matter what so long as they are good men—meet in the council chamber ; they would model the council of the R.C.V.S. after the fashion of the noblest representative assembly in the world. Show them a higher type, and they will "adopt it on the instant."

We have got our "Franchise Bill" ; every M.R.C.V.S. is a voter, and we would now go in for "Redistribution." And while retaining all that is good and true and bright in London and Lancashire, we would do away with the mediocre selfish element, and fill its place with something more representative, less narrow-minded, one-sided, and superficial.

In a "minority" Scotland will always be. She has won her way in a minority. But give her veterinary surgeons Parliamentary representation,

and I would fain hope they will send eight or nine men to Council before whose faces such vagaries as "A Southern Examining Board," "Pupilage," "Farcial Fellowship," and even the "Docking of Horses" shall flee away.

IX. *The National Veterinary Medical Association* "follows the lines of the British Medical Association."—That society, if I mistake not, has been in Edinburgh—it or some such association visited Canada this year. Might it not be well for the National Society to visit Edinburgh next year, and ascertain whether as good a meeting may not be had in Scotland as elsewhere? Dublin should not be forgotten; and even a rubbing of noses and brains with Yankee confrères might be productive of great mutual benefit. To those with time and means a very pleasant summer trip. A national society should not always go where it will be "best supported," but where it will do national good.

X. *Scottish Amalgamated Society.*—The idea was broached by Mr. Rutherford one evening, and the places of meeting soon fixed; without a thought, save the improvement and the promotion of good fellowship among the members of the three societies. That this society has done good and been fairly successful is simply owing to the fact that it supplies a want much felt. In this society the R.C.V.S. and N.V.M.A. may find a means of making new and warm friends, and in it also the veterinary surgeons of Scotland may find, if they choose, a power and a way of making their voice heard.

XI. *Deductions.*—The work of the Secretary of the R.C.V.S. is "great and ever-increasing." Lessen it, appoint a small subsection of the Council, or a provisional committee in Edinburgh or Glasgow for the transaction of minor Scotch business. Save 2,000 circulars and stamps each May, and the labour of issuing, collecting, and scrutinising them; adopt Parliamentary representation, or some better plan; save money; save time; get a better result; secure a truly representative council; make Council and Examining Board representative of the veterinary surgeons of the country; let the R.C.V.S. and the N.V.M.A. go occasionally to a few of the larger cities, doing good and making friends.

The Royal College of Veterinary Surgeons should surely be a grand national institution, embracing in its fold all veterinary surgeons, and every veterinary surgeon, in the three kingdoms, worthy of the name; regarding them all, wherever placed, with equal favour. Not choosing its councillors and examiners from one particular country or city, but looking abroad and around with an impartial eye, and choosing the best men—the most truly representative men—the men of the greatest ability, integrity, and sound judgment. Not locating itself in one favoured city or town, but moving about occasionally at least; giving light, life, strength, and encouragement to all parts, and especially the weaker parts of the profession. The duty of the veterinary surgeons of the present day is surely not to follow too blindly a Charter framed forty years ago, but to enlarge the border, and strengthen the stakes, and make the R.C.V.S. a broader, a stronger, and a nobler institution.

That this disjointed epistle may, with the others before it, be but a slight means to this end, is the sincere wish of, sir,

Yours very truly,

Slateford, 17*th November*, 1884. C. CUNNINGHAM.

THE PATHOLOGY OF "BURSATTI."

SIR,—Mr. Smith, in the July number of the VETERINARY JOURNAL, has been at pains to instruct the profession on how diseased tissues should be hardened and prepared for examination under the microscope; and as I have spent considerable time over this subject, I beg to make a few observations on his conclusions.

The fungi, which were first described as diagnostic by Mr. F. F. Collins, late Inspecting Veterinary Surgeon, Bengal Army, have, as most of your readers are aware, since been a good deal dilated upon; but the outcome of the whole question is that little that is practical, or at all supportable on facts of plain experience, is as yet forthcoming in regard to this subject; and we are left as far as ever we were removed from an understanding of all those many features which surround the clinical history of Bursatti, and which still require explanation.

Mr. Smith writes that sores should not be examined after hardening in chromic acid, as parasites seldom exist then. My own experience is that the parasites abound, and are present in greatest numbers in those tissues (Bursatti as well as other morbid specimens, as, for example, pieces of liver that has undergone fatty change) which have been so hardened. And reference to the literature of this subject of parasitic development in many diseased tissues shows me that I am not alone responsible for such an opinion. It should be stated that Drs. Lewis and D. D. Cunningham—who, at the special request of the Government of India, made a most thorough investigation into the nature, causes, and pathology of "Oriental Sore," or *Lupus Endemicus*, in 1876—pointed out that "tissues which have been preserved in solutions of chromate of potash, or chromic acid, are very apt to become the sites of growth of fungi." In corroboration of their views Drs. Lewis and Cunningham stated that "one of the specimens of *healthy* skin which we preserved in chromic acid during our stay at Delhi, was a few weeks subsequently found to be covered with a thick layer of mould, as well as the fluid itself, which, having partially evaporated, had allowed the fragment of skin to project somewhat beyond the surface." (Vide Report on the "Oriental Sore," as observed in India, by Drs. Lewis and D. D. Cunningham, Special Assistants to the Sanitary Commissioner with the Government of India, 1876.)—I remain, sir, yours very obediently,

R. W. BURKE, A.V.D.

Cawnpore, 17*th October*, 1884.

MEDICINE AND ADVICE.

DEAR SIR,—Will you kindly answer the following question through the "Correspondence" page of the VETERINARY JOURNAL? Do you think it would be derogatory to the profession for a *respected* M.R.C.V.S. to issue a small pamphlet giving a *few* practical directions to stock-keepers in isolated localities in his own district, at the same time recommending a few of his own special medicines? The influx of quack remedies renders it almost a matter of necessity.—Yours respectfully,

J. C.

[We do not see anything unprofessional in a veterinary surgeon furnishing his clients with advice as to the use of the medicines he may give for the use of their stock. That would not be a case of teaching every farmer to be his own veterinary surgeon.—ED. *V. J.*]

AN EXPLANATION REQUIRED.

SIR,—I take the liberty of sending the enclosed cutting from the *Dundee Advertiser*, for which you may find room in your next issue, and would like to know if Mr. Spreull was correct in stating that there was an *aneurism* of the posterior vena cava. It is contrary to the teaching I have received; but as Mr. Spreull is a Fellow of the R.C.V.S. and an ex-examiner for the Highland and Agricultural Society, he may have been quite correct. Perhaps some of your readers will relieve the mind of an inquiring "STUDENT."

"*Important Decision as to the Warranty of a Cow.*

"On 25th March last, Mr. James Kydd, cow-feeder, Broughty Ferry, purchased at Messrs. Dodds and Bathie's auction mart, Dundee, a cow which was warranted by the seller, Mr. William Liddell, Denny, to be 'all correct and sound.' The cow was taken delivery of by Mr. Kydd, but died in his possession fifteen days after the day of sale, from the results of a cold. A *post-mortem* examination showed that the animal had been suffering from internal complaints previous to the sale, and Mr. Kydd brought an action against Mr. Liddell for repayment of the price, which he had settled, less the net proceeds of the carcase of the animal, on the ground that it was unsound at the date of sale. A proof was lately led in the case, and the parties' agents heard. Sheriff Cheyne has now issued the following interlocutor sustaining the pursuer's contentions :—

"'Dundee, 8th September, 1884.—The Sheriff-Substitute having advised the process, finds that at a public sale held in the Cattle Market, Dundee, on 25th March last, the pursuer purchased a milch cow belonging to the defender, at the price (which was duly paid by bill) of £20 5s., and on a warranty that she was all correct and sound: Finds that the said cow was taken direct by the pursuer straight from the market to his byre in Broughty Ferry, and that she died there on 9th April: Finds that during the fifteen days that she was in the pursuer's possession the cow was dull and off her food, and did not give much milk; but the pursuer, not unreasonably, attributed these symptoms to the fact that she had recently calved, and, till within a few hours of the death, did not apprehend any danger or see any cause to call in professional assistance: Finds that, in the opinion of Mr. Spreull, a veterinary surgeon of experience, who made a *post-mortem* examination of the carcase, on behalf of the defender, and who is the only witness upon the point, the death "arose from the effects of exposure to cold in transit, by rail or otherwise, setting up irritation of the bronchial tubes, congestion of the lungs, and emphysema of the interlobular tissue;" but the *post-mortem* examination also revealed the fact that the animal was suffering from an aneurism on the posterior vena cava just as it passes through the liver, which aneurism, Mr. Spreull says, must have existed for several months, at all events might at any moment have proved fatal, and though probably not the direct inducing cause of the acute disease of which the animal died, would have the effect of debilitating the system, and so predisposing the animal to take cold and preventing its throwing a cold off: Finds, as a consequence of the preceding finding, that the cow was unsound at the time she was bought by the pursuer, and that, there being thus a breach of warranty, the pursuer is entitled to repetition of the price and costs (3d.) of bill-stamp, under deduction of the net proceeds received by him for the carcase, which amount to £5 13s. 6d.; and having regard to these findings, decerns against the defender for the sum sued for, with interest, as craved: Finds the pursuer entitled to expenses, allows an account of these to be given in, and remits the same, when lodged, to the auditor of court to tax and report. (Signed) 'JOHN CHEYNE.'

"'*Note.*—That the defender gave the warranty in entire good faith, and in the full belief that the cow was sound, I do not for one moment doubt; but it is conclusively shown by Mr. Spreull's evidence that, in point of fact, the

cow was at the date of the sale labouring under a chronic disease which constituted it unsound; and, though in Mr. Spreull's opinion that chronic disease was not the direct cause of that acute malady which actually caused death, it undoubtedly rendered the animal less able to resist the acute malady; and that being so, it humbly appears to me that the defender must answer as for breach of warranty. The case of Brown *v.* Boreland, 29th June, 1848, 10 D., 1,460, referred to at the discussion, is very much in point. Of course, if it had been shown that the pursuer treated the cow in such a way as would have occasioned its death had it been healthy, there might have been room for refusing him repetition of the price; but nothing of the kind has been shown. It is certainly possible that if a veterinary surgeon had been at once called in by the pursuer, and active treatment administered, the cow's life might have been prolonged; but, having got a warranty of soundness with her, and having done nothing to her beyond driving her from Dundee to Broughty Ferry, the pursuer cannot, I think, be blamed for attributing, as he says he did, her dulness and the other symptoms which she exhibited to the fact that she had recently calved. As regards expenses, I have had some doubts whether I ought not to have allowed the pursuer only those expenses which he would have incurred had he brought the action in the Debts Recovery Court, in which court, I am inclined, having regard to recent decisions, to think it might competently have been brought; but the point is certainly not free from doubt, and that being so, I have come to the conclusion that I ought to make the ordinary finding. (Itd.) 'J. C.'

"Agent for pursuer—C. C. Duncan: for defender—W. E. R. Young."

TO CORRESPONDENTS.

Communications from Messrs. Dawson, Harrison, Cox, Nettelton, and several meetings of societies reports, as well as correspondence, are unavoidably held over until next month, in consequence of the large demand made upon our space by the introductory lectures of schools.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. W. Burke, A.V.D., Cawnpore; G. A. Banham, Cambridge; P. S. Abraham, Dublin; Arnold and Sons, London; R. A. N. Powys, London; "J. C."; A. Osler, Philadelphia; J. B. Gresswell, Louth; "Student"; J. Macqueen, Glasgow; T. Greaves, Manchester; J. Harrison, Burtergill; W. G. R. A. Cox, Newcastle-on-Tyne; Professor McCall, Glasgow; "Peripatetic"; C. Cunningham, Slateford; J. Nettelton, Northallerton; W. Penhale, Plymouth; J. B. Wolstenholme, Manchester; R. J. Dawson, Tunstall, Suffolk; T. D. Lambert, Dublin; "A Reformer."

BOOKS AND PAMPHLETS: *C. Walford*, A Statistical Chronology of Plagues and Pestilences as affecting Human Life; *O. Siedamgrotzky* and *V. Hofmeister*, Anleitung zur Mikroskopischen und Chemischen Diagnostik der Krankheiten der Hausthiere; Procès-Verbal de la Société Vétérinaire d'Alsace-Lorraine.

JOURNALS, ETC.: *Journal of the Royal Agricultural Society of England; Live Stock Journal; Mark Lane Express; British Medical Journal; Lancet; Quarterly Journal of Veterinary Science; Revue Vétérinaire; L'Écho Vétérinaire; Edinburgh Medical Journal; Journal of Comparative Medicine and Surgery; Recueil de Médecine Vétérinaire; Der Thierarzt; Repertorium für Thierheilkunde; American Veterinary Review; Archives Vétérinaire; Archiv für Wissenschaftliche und Praktische Thierheilkunde; Œsterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Der Hufschmied; Tidskrift för Veterinar-Medicin och Husdjursskotsel; Chicago Live Stock Journal; Annales de Médecine Vétérinaire; Clinica Veterinaria; Animal World; Tidskrift für Veterinar-Medicin.*

NEWSPAPERS: *The Bradford Observer; Lahore Civil and Military Gazette; Times; Montreal Gazette; Globe.*

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